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RESOLUTION OF NATIONAL ASSOCIATION.

"Resolved that in the opinion of the board of directors of the National Independent Telephone Association the now existing alliance between the American Telephone & Telegraph Co. and the Western Electric Co. is unfair to the interests of the public and the telephone business."

Economic Freedom.

In last week's issue, TELEPHONY called attention to the creation of a committee by the board of directors of the National Independent Telephone Association, to investigate the relationship between the American Telephone & Telegraph Co. and the Western Electric Co. It is hoped the work of this committee will be so thorough that this unfair alliance will be dissolved, resulting in an open field and precluding the possibility of a monopoly in the manufacture of telephone apparatus and supplies. This is the most important issue before the telephone field. Its final adjustment is necessary to any permanent and satisfactory relationships between operating companies and manufacturers.

In the American Telephone & Telegraph Co.'s report for 1914, Mr. Vail, in referring to the relationship between the A. T. & T. Co. and the Western Electric Co., says: "The contract defining this relation has been investigated by public commissions, and not one has found it other than a desirable arrangement."

Is this true? Look at these facts:

The Vermont commission in commenting upon these relations said that in its opinion the addition of 10 per cent. to the cost of material made by the telephone company's engineer in the inventory submitted in the case (in re Addison & Canton, et al., filed March 14, 1914), is unwarranted. The board said: "We think that the percentages paid to the Western Electric Co. for acting as purchasing agent could be saved if the New England company made these purchases itself, and that these percentages, if so utilized, would be ample to cover any additional charges of material. The commission has therefore unloaded the 10 per cent. charge upon material."

In a Georgia case (City of Columbus et al. vs. Southern Bell Telephone Co. decided Sept. 8, 1914), the commission said: "This contract (Western Electric and Southern Bell) is objectionable on the same principles as that with the American Telephone & Telegraph Co., although we are inclined to think not so objectionable as to actual results."

Many well informed telephone men hold that the connection between these companies is not only unfair but illegal as well. It is the consensus of opinion that this matter must be settled finally. If it is the pleasure of the federal authorities to allow the Western Electric Co. to create a monopoly in the telephone manufacturing field, the Independents have no redress except to carry a test case to the United States Supreme Court, in which event there should be little doubt as to the outcome.

It is to be hoped a quicker way will be found and one based on simple justice to all parties concerned. TELEPHONY will do all in its power to assist in bringing about an open field, a condition that will insure competition in the manufacturing field, and prevent one company from securing a monopoly.

Popularity of the Telephone Directory.

As the use of telephones increases, the popularity of the telephone directory as a reference book grows by leaps and bounds. Many drug stores no longer maintain city and town directories, the information found in the telephone book sufficing for their patrons in the great majority of cases. This does not mean, of course, that the old fashioned municipal directory is likely to go into the discard; but it shows how pervasive the telephone is getting

to be when one of the most time-honored functions of the corner drug store yields to the more convenient service furnished by the subscriber list.

The drug store without a telephone pay station is today classed among the back numbers. While the telephone book cannot fill the bill every time, it solves the address problem so often that busy men prefer to consult it first. In large cities, with suburbs geographically identified with the metropolitan community but politically separated therefrom, such as Boston, Mass., the telephone book is immeasurably superior to local directories as a means of rapidly locating business concerns, professional men, etc., whose addresses do not happen to be in the city proper. Their interests may be as much identified with the metropolitan center as though they resided within its political limits but they will not be listed in city directories.

52 Cards in Fool's Deck, Too

By HERBERT KAUFMAN

There are fifty-two cards in a fool's deck, too, but aces are wasted upon asses. It takes a good head as well as a strong hand to win any game. Incompetence reduces values—it's a spot eraser. Ability can raise jacks to the level of kings.

Every pasteboard is a deuce under the management of a dunce. The play's the thing. At solitaire only are all men equal, but that's because there's no rivalry. Wherever there's a show for competition, superiority must manifest itself.

Accident occasionally masquerades as success, but it can't keep up the disguise for long. Imitations aren't durable. The first essential to an able bluff is an established reputation for reliability—everybody "calls" a chronic loser.

A clever strategist can afford to take occasional chances—he reads the psychological moment in the other man's countenance. A poor thinker has a clock face and tells the time to act. Everybody's chances are equal. Most of us don't know how to handle opportunity when we hold it. Diagnosis demonstrates the cause of all failures. The expert can easily analyze the discard.

Old Cyrus Simmons had a knack of making his men "see themselves as he saw them." From time to time he'd slip a few pertinent remarks into the pay envelopes of his employes. Here's a characteristic example of his philosophy:

"You don't count if I can't count on you. My favorite in this establishment is the delivery man.

"I can't keep cost slips without time clocks. If you object to verifying your record, you must be ashamed of it.

"If you don't sell a man his first bill of goods, it's your fault; if he doesn't buy again, it's my fault. Merchandise can't get a hearing and talk won't get a reorder.

"If you're not sure of the next step, don't take it—only idiots and blind men walk aimlessly.

"When you're competent to exchange my orders, you're smart enough to order me; the fact that you don't, proves that you ain't.

"I'd rather employ a convict than a fool. I can protect my cash drawer, but I can't anticipate the costly errors of a bonehead.

"When you realize that you're indispensable, I'll decide that you're not. While you're afraid of the man behind, you'll work to keep ahead.

"Cut out your bad habits. I can't afford your headaches. You can't dissipate in your own time without showing the effects in mine.

"I never yet saw the point of a funny story in office hours. I'm prejudiced against humorists who 'consider' business a joke.

"Write on a telegraph blank and then say it. When a man understands what he's talking about, he never wastes words."

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Service Tests of Treated and Untreated Telephone Poles

Results of a Series of Experiments Conducted by the United States Forest Service in Co-operation with the A. T. & T. Co. to Obtain Data on Efficiency of Various Preservatives and Methods of Treatment—Plan of Experiments and Methods of Inspection Used

By Clyde H. Teesdale*

The Forest Service of the United States Department of Agriculture, in co-operation with the American Telephone & Telegraph Co., placed a series of experimental poles in the Warren-Buffalo line, Poughkeepsie-Newton Square line, and Augusta-Savannah and Helena-Meldrim lines, the object of which was to obtain data on the efficiency of various preservatives and methods of treatment. The results given in this article are based on inspections of these experimental poles and are of interest, not only to pole users, but to others desiring information on the relative value of the various wood preservatives used.

Condition When Set*	Preservative Used, Sold as:	Method of Treatment	Absorption Secured per Pole		
			Average Lbs.	Maximum Lbs.	Minimum Lbs.
Green	.....	Untreated	...	....	...
Seasoned	.....	Untreated	...	....	...
Seasoned	Coal tar	Brush, 1 coat	...	....	...
Seasoned	Creolin	Brush, 1 coat	3.39	4.13	2.88
Seasoned	Creolin	Brush, 2 coats	7.60	10.63	5.5
Seasoned	Wood creosote	Brush, 1 coat	2.42	3.63	1.75
Seasoned	Wood creosote	Brush, 2 coats	5.43	6.63	3.25
Seasoned	S. P. F. carbolineum	Brush, 1 coat	3.55	5.13	1.38
Seasoned	S. P. F. carbolineum	Brush, 2 coats	4.38	6.63	3.0
Seasoned	Avenarius carbolineum	Brush, 1 coat	1.98	2.25	1.13
Seasoned	Avenarius carbolineum	Brush, 2 coats	4.52	6.63	2.5
Seasoned	Coal-tar-creosote	Brush, 2 coats	7.77	11.75	4.13
Seasoned	Coal-tar-creosote	Open-tank	22.41	44.0	8.0
Green	Coal-tar-creosote	Open-tank	15.20	39.0	4.0

*Describes also the condition at the time the treatment was applied.

Table No. 1. Treatment of Poles in Warren-Buffalo Line.

Plan of Experiments.

During August and September, 1905, 613 treated poles and 551 untreated green and seasoned chestnut poles were placed in the Warren-Buffalo line between Warren, Pa., and Dayton, N. Y. They were all 30-foot poles. Table No. 1 gives the method of treatment, and table No. 2 the plan of setting the poles. Owing to difficulties in delivering the poles along the line, about 30 per cent. were set with no definite plan. This line extends through cultivated fields, woodlots and meadows, giving a variety of soil conditions.

In the Poughkeepsie-Newton Square line 72 30-foot experimental poles were placed near Dover, N. J., in the fall of 1902. No definite plan was followed in setting these poles.

The Augusta-Savannah and Helena-Meldrim lines contained 816 experimental poles set near Savannah, Ga., in the summer of 1905. Half of these poles were of Southern white cedar and half were of chestnut. The treated poles were alternated with the untreated. The series was arranged as in table No. 3, which was repeated 12 times for each species, series No. 2 beginning with pole No. 35, series No. 3 with pole No. 69, etc. The amount of preservative applied is given in tables Nos. 4 and 5.

*In charge section of wood preservation, Forest Products Laboratory, Madison, Wisconsin.

Method of Inspection.

The soil was removed from the base of each pole to a depth of from six inches to one foot and the circumference measured at or close to the ground line. Since this measurement was made to determine the original circumference of the pole, which, unfortunately, had not been measured when the poles were set, the proper point at which to take the measurement was carefully selected. If loss by decay impaired the accuracy of the measurement, proper allowance was made in the figures recorded.

After the first measurement, the pole was carefully examined with hatchet and prod for decay or insect injury. Decayed portions of the poles, if of any extent, were removed with the hatchet, and a second measurement of circumference was then made at the point of greatest decay. This was usually found to be at or near the point selected for the first measurement. Poles which appeared to be unaffected by decay, but which rang hollow when struck with a hatchet, were bored to determine how far decay had actually progressed. After inspection, creosoted plugs were driven into the holes and the soil which had been removed from about the poles was replaced.

In many cases decay occurred in the interior of the poles and left either a sound outer shell, or formed "pockets." In the latter case, the width and depth of the pocket were ascertained. The circumference measurement was then corrected to allow for the reduction in strength due to this decay, according to a formula furnished by the American Telephone & Telegraph Co.

No. of Pole	Condition When Set	Preservative Used, Sold as:	Method of Treatment
1	Seasoned	Avenarius carbolineum	Brush
2	Seasoned	.....	Untreated
3	Seasoned	Avenarius carbolineum	Brush
4	Green	.....	Untreated
5	Seasoned	S. P. F. carbolineum	Brush
6	Seasoned	.....	Untreated
7	Seasoned	S. P. F. carbolineum	Brush
8	Green	.....	Untreated
9	Seasoned	Coal-tar creosote	Brush
10	Seasoned	.....	Untreated
11	Seasoned	Coal-tar creosote	Brush
12	Green	.....	Untreated
13	Seasoned	Coal-tar creosote	Open-tank
14	Seasoned	.....	Untreated
15	Seasoned	Coal-tar creosote	Open-tank
16	Green	.....	Untreated
17	Seasoned	Wood creosote	Brush
18	Seasoned	.....	Untreated
19	Seasoned	Wood creosote	Brush
20	Green	.....	Untreated
21	Seasoned	Coal-tar creosote	Open-tank
22	Seasoned	.....	Untreated
23	Seasoned	Coal-tar creosote	Open-tank
24	Green	.....	Untreated
25	Seasoned	Creolin	Brush
26	Seasoned	.....	Untreated
27	Seasoned	Creolin	Brush
28	Green	.....	Untreated
29	Seasoned	Coal-tar	Brush
30	Seasoned	.....	Untreated
31	Seasoned	Coal-tar	Brush
32	Green	.....	Untreated
33	Green	Coal-tar creosote	Open-tank
34	Seasoned	.....	Untreated

Note.—The above series was repeated 24 times, series No. 2 beginning with pole No. 35, series No. 3 with pole No. 69, etc.

Table No. 2. Plan of Setting Poles, Warren-Buffalo Line.

When the outer shell was intact, it was sometimes deemed inadvisable to penetrate it to determine the extent of the decay. In such cases the necessary correction to the circumference measurement could be only roughly approximated by the appearance and "sound" of the poles.

Pole No.	Preservative, Sold as:	Condition
1	Avenarius carbolineum	Seasoned
2	No treatment	Seasoned
3	Avenarius carbolineum	Seasoned
4	No treatment	Green
5	S. P. F. carbolineum	Seasoned
6	No treatment	Seasoned
7	S. P. F. carbolineum	Seasoned
8	No treatment	Green
9	Spirittine	Seasoned
10	No treatment	Seasoned
11	Spirittine	Seasoned
12	No treatment	Green
13	Creosote	Seasoned
14	No treatment	Seasoned
15	Creosote	Seasoned
16	No treatment	Green
17	Creosote	Seasoned
18	No treatment	Seasoned
19	Creosote	Seasoned
20	No treatment	Green
21	Imperial wood preservative	Seasoned
22	No treatment	Seasoned
23	Imperial wood preservative	Seasoned
24	No treatment	Seasoned
25	Creolin	Seasoned
26	No treatment	Seasoned
27	Creolin	Seasoned
28	No treatment	Green
29	Tar	Seasoned
30	No treatment	Seasoned
31	Tar	Seasoned
32	No treatment	Green
33	Tar	Green
34	No treatment	Seasoned

Note.—The preservative was heated and applied to the poles with a brush. The poles were treated for a distance of six feet beginning two feet from the butt.

Table No. 3. Plan of Setting Poles Near Savannah, Ga.

These conditions affected approximately 50 per cent. of the untreated cedar poles left in the Augusta-Savannah line (not including the removals), but were much less prevalent in the treated cedar and in the chestnut poles. Poles entered as removals are not included in the calculations of loss of circumference.

Previous Inspections.

The first inspections of the Warren-Buffalo and Poughkeepsie-Newton Square lines were made in 1910, after five and eight years of service, respectively, and are reported in Forest Service Circular No. 198. The first inspection of the Augusta-Savannah and Helena-Meldrim lines was made in April and May, 1909, and reported in Forest Service Bulletin No. 84. The second inspection was made in November, 1912, and reported in the Engineering News on November 27, 1913.

The inspections of the various lines were made by representatives of the Forest Service, the American Telephone & Telegraph Co., and in the Southern lines, of the Southern Bell Telephone & Telegraph Co.

Preservative, Sold as	Number of Coats	Amount Applied per Pole: Average Lbs.	Maximum Lbs.	Minimum Lbs.
Avenarius carbolineum....	2	3.6	4.7	2.6
S. P. F. carbolineum.....	2	3.7	5.3	2.8
S. P. F. carbolineum.....	1	1.6	1.6	1.6
Spirittine	3	4.7	5.5	4.1
Creosote	2	4.9	6.4	3.3
Creosote	3	7.1	8.0	5.6
Imperial wood preservative	2	4.4	5.3	3.4
Creolin	2	6.0	7.4	4.5
Tar	1	7.0	..	..

Table No. 4. Preservative Applied in Brush Treatment, Southern White Cedar.

Latest Inspections.

The second inspection of the Warren-Buffalo line was made in October, 1913, after the poles had been in service about eight years. The results of this inspection are given in Fig. 1. For comparison, the results of the first inspection are also included.

The comparatively small number of poles treated with only one coat of some of the preservatives renders the results in those cases less conclusive than where two coats were used.

Analyses made by the American Telephone & Telegraph Co. of two samples of creolin showed a water content, respectively, of 20 and 90 per cent. So great a variation in composition must detract, of course, from the value of the test, so far as this preservative is concerned.

Preservative, Sold as:	Number of Coats	Amount Applied per Pole: Average Lbs.	Maximum Lbs.	Minimum Lbs.
Avenarius carbolineum.....	2	4.1	5.1	2.9
Avenarius carbolineum.....	1	3.7	4.6	2.4
S. P. F. carbolineum.....	2	4.2	5.5	3.1
S. P. F. carbolineum.....	1	3.2	3.9	2.5
Spirittine	3	6.7	9.0	4.9
Creosote	2	7.0	10.6	4.3
Creosote	3	6.5	8.3	3.8
Creosote	1	5.1	5.5	4.6
Imperial wood preservative.	2	5.4	7.0	3.8
Creolin	2	6.4	8.4	4.5
Tar	1	7.0	..	..

Table No. 5. Preservative Applied in Brush Treatment, Chestnut.

The second inspection of the Poughkeepsie-Newton Square line was made in October, 1913. The results of the inspection are given in Fig. 2. These poles were in much worse condition than those in the Warren-Buffalo line. None was sound, and 68 per cent. were badly decayed. Those brush treated with carbolineum and spirittine were treated in the green condition, which probably accounts for the unsatisfactory results obtained from the treatment.

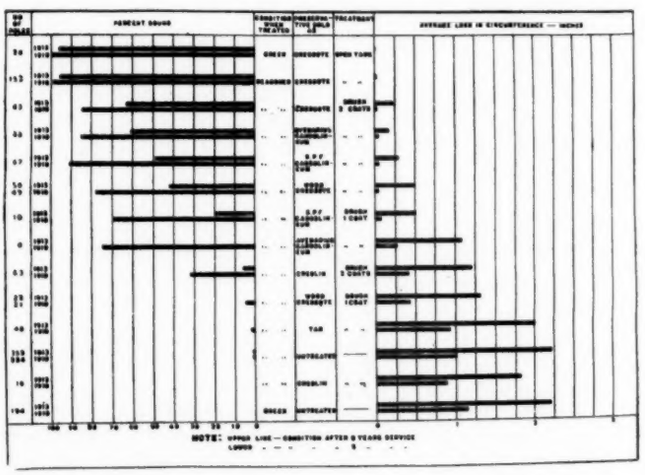


Fig. 1. Chestnut Poles, Warren-Buffalo Line, After 5 and 8 Years.

The third inspection of the Augusta-Savannah and Helena-Meldrim line was made in November, 1913, and the results of this inspection are given in Figs. 3, 4 and 5.

Most of the untreated cedar posts were found to be in a state of advanced decay, as is shown by the fact that 85 per cent. were classed as removals. The sapwood was decayed in every instance, and all but 5 per cent. were badly decayed in the heartwood. The seasoned poles were in much worse condition than those set green. The former had been held for from one to two years before they were set, and it is probable that the conditions were such

that decay-producing fungi were able to get a start during this period.

The treated poles were in a better condition than the untreated ones, excepting those coated with tar, which proved of no value as a preservative; 10 per cent. were still perfectly sound, and 40 per cent. were removed. The failure of the treated poles was probably due in many cases to the exposing of untreated wood in the interior of the poles after the treatment had been applied, due either to checking or to some other cause. Had the penetration been considerably deeper than that obtainable by a brush treatment, much longer life would certainly have been secured.

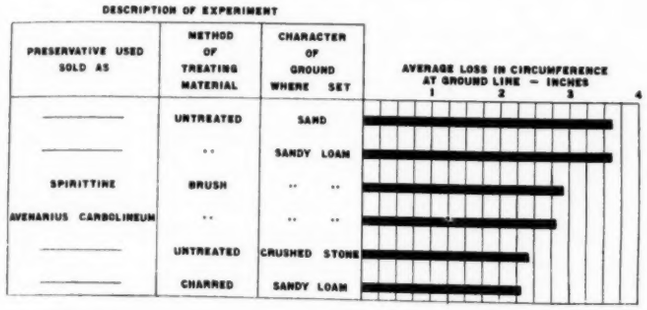


Fig. 2. Poles of Poughkeepsie-Newton Square's Line After 11 Years.

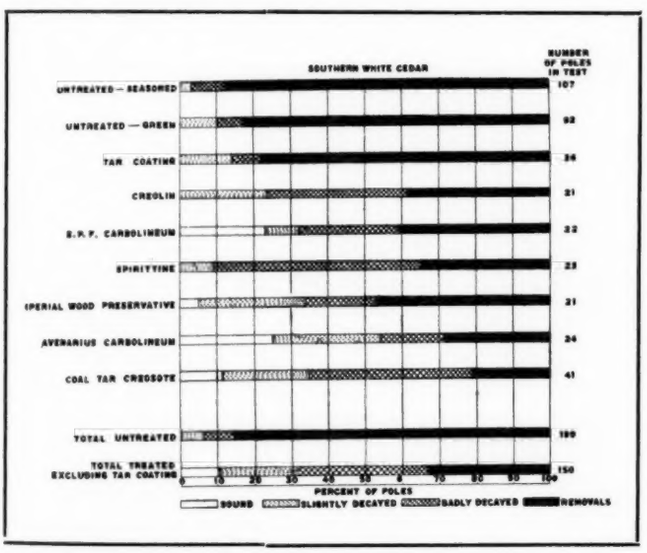


Fig. 3. Southern White Cedar Poles After 8½ Years.

The average life of untreated Southern white cedar poles in this line was estimated to be 7.1 years when set seasoned and 7.6 years when set green. Estimates of the life of the treated poles are necessarily more or less inaccurate because of the small number removed. As nearly as could be determined, the average increase in life from the brush treatment of Southern white cedar in this line with all preservatives except tar coating was, roughly, about 2½ years to 3 years.

The chestnut poles in the Augusta-Savannah and Helena-Heldrim line were found to be in a much better condition than the cedar. About 45 per cent. of the untreated poles were still only slightly decayed, while of the treated poles (excluding tar coating) 75 per cent. were either sound or only slightly decayed.

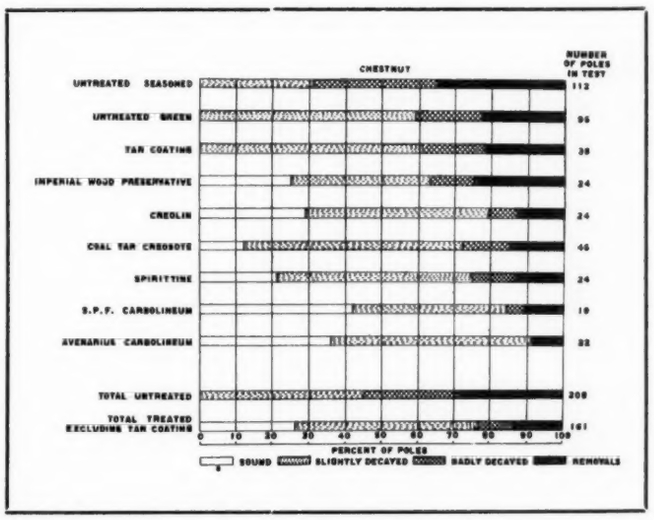


Fig. 4. Chestnut Poles After 8½ Years' Service.

The average life of the chestnut poles could not be accurately determined because of the small number of removals. By making assumptions as to the durability of poles still remaining in the line, however, a rough estimate of about 11 to 12 years was obtained for untreated chestnut poles. No estimate of the durability of treated poles would be warranted at this time.

Summary.

The following summary is drawn as a result of these experiments:

1. The estimated life of untreated Southern white cedar poles set green in the Augusta-Savannah line was 7½ years, set seasoned 7.4 years; brush treated with wood preservatives, about 10 years. Untreated chestnut poles in this line are esti-

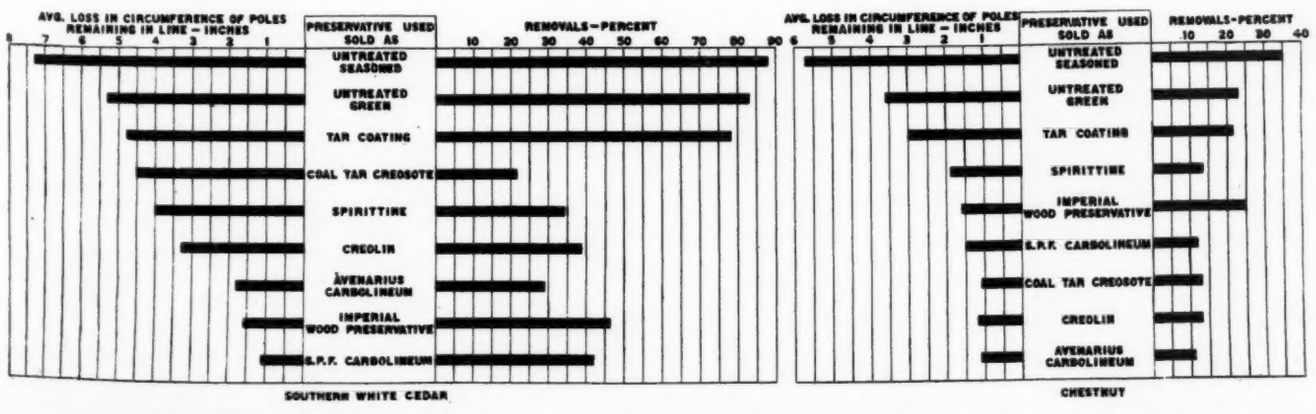


Fig. 5. Percentage of Removals and Average Loss in Circumference of Poles Remaining in Lines After 8½ Years' Service.

mated to last about 11 to 12 years. The results show that a much longer life will be obtained from the Northern lines. The results obtained from chestnut poles afford a striking example of the effect of climate on durability of wood.

2. Seasoned poles set untreated in the Savannah-Moldrim line show a larger percentage of removals, a greater percentage of poles seriously decayed, and a greater loss in circumference than the green ones. This is probably due to the length of time the seasoned poles were held before they were set.

3. Poles coated with tar are in approximately the same condition as the untreated ones. These results indicate that tar coatings are of little value in preventing decay of poles.

4. Good results were obtained with all preservatives except tar and creolin. In general, better results were obtained with coal-tar products than with wood-tar products.

5. The results obtained with carbolineum were about the same as with coal-tar creosote.

6. Untreated poles, set in crushed stone or charred at the butt, showed less decay at the ground line than those set untreated in sand.

7. Fewer removals and fewer badly decayed poles were found in portions of the lines running through swamps and wet locations than in drier situations. The worst conditions were found in cultivating fields and dry sandy situations.

8. Brush treatments with a good preservative give an increased life to poles sufficient to pay well for the cost of treatment. It is quite evident, however, that the amount of preservatives absorbed by the wood is not sufficient to insure any great degree of permanency to the protection. Decay in treated poles was usually found to have peneterated the thin protective coating at one or two points and to extend for considerable distances underneath the sound outer portions. To be really effective, the application should be sufficient to treat all of the sapwood and some of the heartwood.

9. The chestnut poles in the Augusta-Savannah line were in much worse condition than those in the Warren-Buffalo or Poughkeepsie-Newton Square lines.

The 1914 Report

American Telephone Year—Some of Its Special Parts

By J. C. Kelsey

We say and we say and we say,
We promise, engage and declare,
Till a year from tomorrow is yesterday
And yesterday is—where?

I do not know whether James Whitcomb Riley, the grand Hoosier poet, ever owned Independent telephone property. I am quite sure he never was a director of any Independent telephone association, nor a member of any committee empowered to discuss qualified toll contracts. It is possible that he never in his life gave a thought to Bell promises, direct or indirect, yet it seems as if his words indicate some trying experience or he never could have so typified the conditions in the telephone business today.

Years ago we fought hard for our principles. Then a change in general policy took place. The men prominent in association work ceased their hostile resolutions, and began to talk of peace.

The association drifted. We all drifted, believing that a millennium was at hand; that the Bell interests had changed their policy, for their own benefit and yours as well.

No one likes war. It is a double-edged sword, and it seemed for a long time that our right to exist as telephone men was conceded. It seemed for a time that the government was going to take a hand and give aid to the small man. But that is a great deal to expect.

Attorney generals are human, and are dazzled by size, even as you and I. How could 3,000 scattered telephone companies compete for favor against one large billionaire concern?

How could we expect one lone man to understand our needs and rights, not being a telephone man at that? The attorney general is a lawyer and he goes by the preponderance of evidence, appearance, plausibility and all. Apparently, there is no question of who made the best showing.

The situation reminds one of the fable of the fox who told the lamb that peace had been declared, that all animals were to dwell together in peace and harmony. He told of the great things, of the millennium, how even he had seen the error of his ways and was going to reform.

In the midst of his speech the baying of hounds was heard, and the fox took to his heels. Upon being asked to explain his fear of the dogs, he said he was afraid the dogs had not heard the news.

It is all a waste of time to speak of the beauty of constructiveness and peace. Constructiveness and peace in the telephone business cannot exist under the present situation. I am referring to the manufacturing situation.

It is true that some progress may have been made in the past toward constructiveness. We have heard a great deal about it, but the Bell company as a whole has not heard the news.

There is no use of further discussion about the factory situation. There is no use of appeal, persuasion nor patient waiting.

The Bell interests seem so infatuated with their factory that they dream of nothing else. They advance such plausible arguments in its favor that courts, commissions, and even attorney generals, rub their eyes in surprise that anyone should be so brutal as to suggest that such a compatible couple should be divorced.

If we ever expect the situation to be cleared up, real evidence must go to the government. The national organizations must take the matter in hand and work at it.

Commission hearings take place and not one interest appears to answer the Western Electric argument except the complainant. It is up to the associations to get busy on this one issue. It is a big one.

This issue of a toll contract is small beside it. A law has been written which covers the condition, and it should be enforced.

Each manufacturer must get in the wagon and accompany a committee. They must have facts, contracts, sales sheets and information of detailed character. There must be some very powerful medicine administered before the plausible Bell argument can be answered.

Remember, too, that the men who decide are lawyers and not telephone men. Glittering generalities will do no good. It is a case of real work.

Getting down to the 1914 A. T. & T. report, you must

read page 14. The attorney general, courts, commissions, will all shed tears when they read it; especially those tribunals who have ever raised their hands against such a holy alliance.

It will make our tribunals indignant to think that we Independents do not appreciate the Bell company's kindly efforts to allow rural companies to buy standard apparatus. Please observe closely that only rural companies can buy standard apparatus—that puts every Independent telephone company in the rural class. Further, you will note that the licensed Bell companies are allowed to buy anywhere.

You will laugh, but will the government laugh at this sloppy evasion of the fact?

It is dollars to doughnuts that an Independent telephone delegation to a Congressional committee, the Attorney General, or any governmental inquisitive body, kicking on this contract of beauty, will leave Washington, the members feeling that they have committed a sin.

We must have a policy and it is up to our associations of telephone men to define one. If we go on in the present way, our behavior will be looked upon as a defeat. If we make a concession of any kind, it is looked upon as a surrender, and we are dumbfounded to hear the terms extended to us.

The Bell mind has not changed. Some forces have tried to make changes in it, but as a whole there lingers in that mind a picture of Independent switchboards and telephones being burned in the public square as an example to all sinful men.

We say and we say and we say,
We promise, engage and declare,
Till a year from tomorrow is yesterday
And yesterday is—where?

How clearly has Mr. Riley indicated the Bell mind! How closely he delineates us all, waiting, hoping, and wishing for something to come over the horizon without a struggle!

How many deserving Independent telephone men have been forgotten in the pursuit of this phantom and today fully realize that "a year from tomorrow is yesterday."

I just want to show you that the Bell company is in no position to chuckle behind its sleeve. On page 12 of its report you will note that the net earnings to plant and other assets is 5.51 per cent. That earning does not indicate a roaring lion with no responsibility save that of an empty stomach. Besides, you must remember that some of this earning comes from 3,000,000 Independent connecting telephones.

Remember, too, that the public mind is not altogether a stable thing. They may believe in one telephone today and two tomorrow. Every reason exists why the Bell interests should not try to undermine their competitors in any branch of their activity.

During 1914 the Bell company gained 348,000 subscribers at a cost of $50,000,000, or about $143 per telephone station.

In connection with this point is a lesson which applies to the humblest company as well. The Bell company installed four new telephones to retain one. There is no question but that there is considerable abuse of the moving privilege. There is much to be done toward correction of the trouble.

A curious thing about the investment of $50,000,000 is that about 35 per cent. of it went into equipment. In other words, the equipment, which, of course, includes a telephone, less receiver, transmitter and coil, and the switching devices, cost $50 per station—not line at all.

At a glance you can see that the Bell factory gets a price for its equipment far above the figures which apply to the open field of competition. It requires no further analysis to show that the Bell factory has a chance to procure means to fight competition, which ordinary manufacturers do not have.

It seems to me that such figures for equipment should be a crumb of comfort to the Central Union (Bell) minority stockholders.

It is a great thing to be able to sell equipment at $50 a station in a closed market and to quote as low as $17.50 for practically the same requirements in an open market.

No wonder the Bell factory can send 300 salesmen out to gossip about the affairs of Independents and attempt to sow trouble by controverted statements! Ordinary Independent telephone salesmen are supposed to get orders, not weather reports.

Is it not strange that Bell equipment should be as costly as outside distribution? Look at page 4 of the report; you will see little difference.

But get the lesson at once. Would you not like to be able to have an exclusive factory right to put $50 worth of equipment at the disposal of every telephone subscriber? No wonder the Bell factory is in a position to throw an unfair burden upon the Independent telephone factories.

In traffic matters, three calls out of every hundred are long distance—just 3 per cent. It is sometimes hard to see the beauty of a claim of universal service.

The number of local calls average something less than five per day, and that is not bad, either. Very few telephone exchanges handle over seven calls per day per station. The actual cost of handling these calls averages close to two cents. Really, there is chance for economy. A Home telephone company could handle the call for half. Which seems to have economic fitness?

The most interesting thing to me in the report is the study of the maintenance, reconstruction and reserve account on page 5. Current maintenance during the year averages $5.65 per station, a fair figure, and it comes close to the maintenance cost of some of our larger Independent exchange plants.

Reconstruction averages $4.75, or a current depreciation rate of 3⅓ per cent., taking care of wear, tear, rust, obsolescence, inadequacy and change in the art. This is the ordinary conception of depreciation, covering what has actually happened to date, and not what may happen. What may happen is taken care of by the reserve charge, an analysis of which follows.

Now, here is a curious thing. Back in 1905, the Keystone Telephone Co., of Philadelphia, was financed in New York. The question of depreciation reserve naturally came up—not a fund for what has happened or does happen, but a fund to take care of that which may happen.

I remember the ridicule heaped upon the Keystone Telephone Co. and myself for deciding to set aside $4 per station for reserve purposes. Yet the A. T. & T. 1915 annual statement clearly shows that $2.22 is considered enough—and the Bell officials surely should know.

It takes years for murder to out, but it will. Here we have it—$2.22 per station, set aside to care for a property scattered over all our states and subjected to every stress of weather.

We may yet find that our Independent way is the real constructive and conservative pace, after all.

One other point—it is a study of the new business picked up during the year. Fifty million dollars were expended for

new business and 348,000 subscribers paid into the treasury something like $10,380,000, or $30 per station. On the face of it, this looks as if the new business earns an average $2.50 rate. But the toll business averages $8.50 per station. Therefore, on the face of it, the new business picked up, averages $21 rental, or $1.75 a month.

As a matter of fact, the new subscribers will only average $3 in tolls, or possibly $3.50; and this makes the average rental income on new business $27, or $2.25 per month. These rates look dangerously low and are down to Independent levels.

The lesson from this may be said to be that the Bell company is fast approaching an economic limit. Home companies can thrive beautifully on $2.25 rates, but a universal company cannot. The distances are longer, the service is cheaper, and the expenses never become less.

In cities where competition exists, the Home companies pay expenses and interest, and even dividends, honestly earned, on a gross income which is below the actual operating cost of their Bell competitor. That is why I say the Home company institution should be and must be recognized by people, government and all.

Will the public accept the Home company, which gives service at a medium rate, or accept service from a universal company which must have a higher rate, and which only offers a theoretical 3 per cent. outlet?

The value of a universal service, or the ability to give New York or far away connections, cannot be charged to the rental users. It is a great deal like charging more rent in Chicago because there is an eighteen or twenty-hour train to New York. In real life, the passenger pays the extra fare, and so should the long distance user.

Page 8 of the report indicates that the cost of reproduction would exceed the book value by $61,000,000. It is very likely more than that amount. The statement is very conservative.

It is a curious fact that the average Home company has a reproduction cost less than its book value, while every Bell company has just the reverse. The reason is that most Independent companies have been bought from a construction company. You will find a statement such as this—"cost of property and stocks"—in the balance sheet. It means, of course, that the construction company naturally wanted to make a profit.

On the whole, the Bell company did mighty well to make gains in 1914. The telephone business will yet have its recognition of vitality. I feel that the Bell company's prosperity in times of general adversity affects us in the same ratio.

The Bell company really has a chance to be a great, truly great, corporation, if it is brave enough to throw its case on the table and take its chances.

The real ugly problem is the solution of the unfair, illegal and even grotesque situation of a factory, armed with an exclusive contract, trying to imitate the cuckoo by stealthily depositing an egg, as it were, in the nest or home of the Independent factories.

Truly, it reminds us of the dog in the manger.

MORAL: Not tomorrow but today.

Annual Report of Temiskaming Telephone Co.

The annual report of the Temiskaming Telephone Co., Ltd., of New Liskeard, Ont., Canada, for the year ending December 31, 1914, shows a gross income of $39,733, which, compared with the gross income of $36,577 for 1913, shows an increase of $3,156. Deducting $22,677 for expenses left a net income of $17,054, as compared with $12,594 for the previous year. On December 31, 1914, the company had 1,184 subscribers, as compared with 1,167 at the close of the year 1913. The company has paid its regular 8 per cent. dividend during the past year.

The balance sheet of the company is as follows:

ASSETS.

Plant and equipment	$100,050
Building, Liskeard	3,308
Building, Cobalt	2,540
Accounts receivable:	
Tolls	2,666
Rentals	2,512
Sundries	710
Real estate, Cobalt	1,500
Real estate, Liskeard	600
Office fixtures	721
Horses, wagon, etc.	1,036
Tools	484
Unearned insurance premium	174
Stock on hand	4,011
Cash on hand	529
	$120,840

LIABILITIES.

Bills payable	$ 2,500
Bonds	15,000
Accounts payable	1,038
Wages and salaries due	411
Accrued interest	347
Dividends uncalled for	132
Unearned rentals	7,895
Subscribed stock	50,124
Emergency reserve	25,000
	$102,447
Balance at credit of loss and gain account	18,393
	$120,840

The following officers have been elected for the ensuing year: T. McCamus, president; George Taylor, vice-president; A. N. Morgan, managing director, and P. R. Craven, secretary-treasurer.

A Good Time Assured at the Tri-State Convention.

The Tri-State Independent Telephone Association is making great plans for its annual convention, to be held at Memphis, Tenn., on May 21 and 22. One of the features will be a trip up the Mississippi River in the moonlight. Those who have never taken a trip upon this gorgeous "father of waters" will find it not only interesting, but historic in its importance. The Business Men's Club of Memphis is also planning to give the delegates an automobile trip through the different parts of the city.

A large number of manufacturers have already arranged to be present with their exhibits, and a number of papers will be presented on matters of interest to all telephone men. In fact, the Memphis convention promises to be the biggest convention in the history of the Tri-State association in every respect.

Ohio State Plans Extensive Improvements.

According to the present plans of the Ohio State Telephone Co., Toledo will have two new sub-exchanges the coming summer. The improvements will cost in the neighborhood of $100,000 and are designed to relieve the main exchange which in the past few years has had a remarkable growth.

The executive committee of the Ohio State Telephone Co., at a recent meeting, held in Columbus, decided on an immediate addition of 604 miles of long distance lines between Findlay and Fostoria, Milan and Lorain, Milan and Cleveland, Lima and Celina, Springfield and Bellefontaine, Milan and Elyria, Columbus and Mt. Vernon.

"Telephony's" Home Study Course for Telephone Men

A Complete Presentation of the Principles Underlying Modern Telephony in All Its Branches—Arranged Systematically So That Regular Reading and Faithful Study Will Qualify Ambitious Men for Higher Positions—Prepared Under Supervision of Stanley R. Edwards—This Section Written by Jay G. Mitchell

[EDITOR'S NOTE: With this issue of TELEPHONY, the writing of the Home Study Course will be taken up by Jay G. Mitchell. Mr. Hamilton, who has prepared the installments already published, is obliged to direct his entire attention to other matters for the present. Mr. Mitchell has been more or less identified with the telephone industry since 1893, when he entered the employ of the Cleveland Telephone Co. as student in the inspection department. This was before the days of common battery in Cleveland, and most of the lines were working on a common return arrangement.

Jay G. Mitchell.

Since that time Mr. Mitchell's experience has been varied, including electric light and power work, pioneer work on the storage battery, electric automobiles and telephone operation and manufacturing. For the past year he has been in the office of McMeen & Miller, of Chicago. Mr. Mitchell obtained his education at Western Reserve University, Cleveland, Ohio, during the course of which he gained his first knowledge of practical telephony with the Cleveland Telephone Co. He is a full member of The American Institute of Electrical Engineers. His wide experience qualifies him to write authoritatively upon the matters now being taken up in the Home Study Course, especially from the operating man's standpoint.]

A Solution for Problem One.

Question 1.—By an application of the principles laid down in Section 5 (TELEPHONY, January 9, 1915), it is clear that local service between Utico and South Utico is not an element in the situation. Mr. Gaines, however, should establish the fact beyond all question by taking an actual count of the number of messages handled daily between the two centers. This count will answer two questions: First. Is there any community of interest producing telephone traffic between the two communities? Second. Assuming that there is not a community of interest and therefore a toll charge is justifiable on messages between the two places, is there enough traffic—either now or in the probable future development—to render the necessary clerical work of collecting it a profitable matter?

It will be advisable for Mr. Gaines to canvass both communities and sign as many subscribers as possible for a better grade of service on the condition that their lines will be rebuilt and made metallic circuits, and that a new switchboard will be installed in South Utico and, if necessary, in Utico also. Under the conditions outlined in the problem, this will be productive of a future increase in the long distance business from both places.

Question 2.—An estimate of the necessary expenditure to rehabilitate both the outside construction and the central offices should be carefully made and presented to the board of directors. This estimate, which will call for an increase in the capitalization, should be supported by a statement of the increased earnings promised by the new contracts actually made with subscribers. Steps must be taken to ensure the full co-operation of all the employes in the campaign for improving conditions. A standard party line selective system could probably be adopted in order to keep the amount required for construction to a somewhat lower figure than would be the case otherwise. This estimate should include the parts necessary to rebuild the absolutely inoperative or telephones unsuitable for metallic service, and to purchase a moderate stock of new ones. Some grounded lines would, of course, be reserved for the time being for such subscribers as were content with the old standard of cheap service.

Question 3.—It should be explained to the public, through newspapers or other means, that it is impossible to give service suitable for long distance connections on the old grounded circuits with their heavy loads, and that if these classes of subscribers wish to secure the benefits of the efforts being made by the company, they should contract for the better class of service. If the amount of traffic between the two centers is heavy enough to pay the expense, a switching or toll charge should probably be made, as it would be very unlikely that the number of messages to and fro would become any less and the messages might increase to a profitable figure when both centers were giving the better service planned. Under the conditions given in the problem, there is no probability of South Utico and Utico traffic becoming of such character as to demand local exchange service between the two places.

After the switchboard has been installed in South Utico, all the line wires between Utico and South Utico should be removed, except those required for the inter-exchange trunk circuits.

Quiz Questions on the Preceding Installment.

The answer to these questions will be found in the reading section bearing the same number. Answers are not to be sent to TELEPHONY for criticism. For the benefit of those desiring the advantages of a correspondence course,

the Engineering Extension Department of the Iowa State College has volunteered to answer questions and criticize replies to questions and solutions of the problems which will be presented from time to time in connection with the course. No charge will be made for this service and the offer applies to all subscribers of TELEPHONY regardless of whether they live in Iowa or elsewhere. Correspondence should be addressed to the Engineering Extension Department, Iowa State College, Ames, Iowa.

74. What determines the number of lines of force to be provided in the design of an electromagnet?

75. What is meant by magnetic saturation? What is permeability?

76. Why do the magnetic lines of force run one way through the middle of a solenoid and the opposite way outside of it?

CHAPTER V.—Electromagnetic Induction.

77. *Effect of varying the lines of force.* While it is true that any current flowing in a wire causes a magnetic field to be set up around the wire, it is also true that if it is possible to set up a moving or circulating magnetic field around a wire in any way, an electromotive force capable of causing a flow of current will be created in the wire so long as the lines of force are *moving* or *changing* in number around the wire.

These magnetic lines of force must be actually varying in their position or strength relative to the wire to produce this result. For instance, if a permanent magnet is inserted in the solenoid as shown in Fig. 23-*A*, a current will be produced in the turns of the wire while the magnet is moving in and a current in the opposite direction when it is being withdrawn. As soon as the magnet is brought to rest in the solenoid so that its lines of force are in fixed position and strength relative to the coils and do not produce a changing field around the wires by cutting through any turn or turns of the solenoid, the current in the coils will disappear. If the magnet be inserted rapidly so that the number of lines of force cutting the coils per second is large, the voltage of the current produced will be higher than if the insertion is made more slowly and the number of lines of force cutting the coils per second is less.

78. *Direction of flow of induced current.* The rule for determining the direction of current flow is this: When a magnet is inserted in a solenoid, current will be produced in the solenoid, if its external circuit is complete, in the opposite direction to the current that would be required to produce the existing magnetization of the magnet. When the magnet is

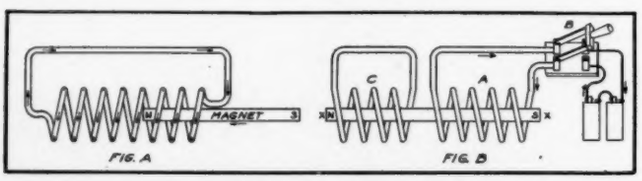


Fig. 23. Varying the Lines of Force.

again withdrawn from the coils, the current produced will be in the opposite direction.

Another rule is called Fleming's rule and is as follows: If the index or first finger of the right hand point in the direction of the magnetic lines of force and the thumb of the same hand point in the direction of the motion taken by the wire "cutting" the lines of force, the middle finger will point in the direction of the induced current in the wire. This is illustrated in Fig. 24 in which the top wires of the solenoid of Fig. 23-*A* are shown being moved to the right over the magnet. The current in these wires is approaching the observer. When the magnet is withdrawn to the right or the solenoid slipped off to the left (both are in effect the same), the direction of motion of the wire, as it cuts the lines of force, is reversed and the

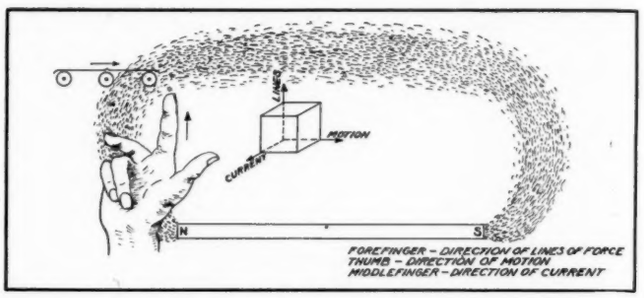


Fig. 24. Determination of Direction of Flow of Induced Current.

current in it would be reversed. In general the current induced in a solenoid is always in such a direction as to oppose by its flow, the changes of magnetic flux producing it.

The production of a current in a solenoid by magnetic induction does not weaken the magnet used, as no energy is taken away from it. The energy or power of the current is obtained from the muscular effort required to insert the magnet in the coil, or to withdraw it after being inserted.

79. *Principle of induction coils.* Now suppose we had a soft iron core permanently fixed in the solenoid and should magnetize and demagnetize it by any method. This could be done by another magnet as shown in Fig. 19-*C* (TELEPHONY of March 20), or by another coil wound on the iron core, through which we could send current. This latter arrangement is shown in Fig. 23-*B*. Each time a current is sent into the coil *A* by closing the switch *B*, we know that the core *X X* will become a magnet through the action of this current. A little thought will show that making the core *X X* a magnet while it is *inside* the solenoid *C* is exactly the *same* as *inserting* a magnet already charged into the windings of the solenoid. Accordingly we should expect a current to be induced in the windings of *C* while the core *X X* is being magnetized. This is exactly what occurs. A current would also be produced in the opposite direction when core, *X X*, was being demagnetized. The condition when *X X* is fully magnetized and the current in *A* is steady, would be precisely the same as that of a permanent magnet resting quietly in the solenoid of Fig. 23-*A*. No current would be produced in *C* until the magnetization of *X X* was started, increased, decreased, or destroyed.

The winding, *A*, in Fig. 23-*B*, in which the original current circulates, is called the primary winding. Primary means first. The winding, *C*, in which we shall always find the induced current, is called the secondary winding. Secondary means subordinate. The whole arrangement, that is two windings on one core, is the principle of the familiar induction coil used in practically every telephone. Only a few turns are shown in the illustrations for the sake of clearness, but in commercial coils, many turns are used. One standard local battery induction coil has 543 turns in its primary and 3,431 turns in its secondary.

80. *Closed and open magnetic circuits.* Repeating coils are

also of the foregoing general description but their core is made so that the magnetic circuit does not include any air gap. It is all iron. This is shown in principle by two sketches in Fig. 25. The reason for this will appear later. For the present it is enough to remember that a core made entirely of iron and including no air in its magnetic circuit, will have a relatively higher permeability than a core so made as to include in itself only a part of the length of its magnetic circuit which must be completed through air.

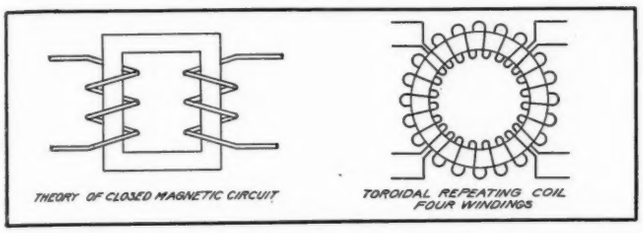


Fig. 25. Closed Magnetic Circuits of Coils.

Electric light transformers are another example of separate windings on the same core. Like the repeating coil, no air gap is allowable in their magnetic circuit. A magnetic circuit so made as to include no air gap is called a closed magnetic circuit. One having an air gap of any length whatsoever, is called an open magnetic circuit. Each has qualities which demand that it be used in various kinds of apparatus, but it is seldom that the two types can be used in the same type of apparatus interchangeably.

81. *Constant currents.* It is impossible, from a strictly accurate standpoint, to produce an electric current that does not vary in strength. There are a great variety of reasons for this but it is not in the least important from a practical point of view. Constant currents can be obtained in a number of ways, that is, currents constant as far as ordinary requirements go.

Currents flowing continuously in the same direction and practically constant in strength are called direct currents. Currents flowing in the same direction always, but interrupted regularly, flowing for a definite period each time and being interrupted for a definite period between the flows of current, are called pulsating currents. When the interruptions of pulsating current come rapidly, two or more per second, the separate spurts of current are called current impulses or briefly impulses. This kind of current is used to drive the automatic switches in automatic and semi-automatic exchanges. The speed at which the separate impulses for this purpose are fixed, ranges in the different systems from 1,000 to about 2,000 per minute.

82. *Alternating currents.* Currents which change their direction of flow, either regularly or otherwise, are called alternating currents. The current used for ringing is generally alternating, although in systems having "biased" ringer selective telephones, pulsating current is used to operate the "biased" ringers. The currents that transmit the words spoken into the telephone transmitter to the distant station are alternating and are called voice currents. They change in direction very rapidly and at very irregular rates, the average being somewhere in the neighborhood of one thousand per second for all kinds of voice pitch and quality. High pitched voices produce more rapid reversals of the voice currents and low pitched voices, slower.

Let us suppose a permanent magnet of the horseshoe type is arranged with a coil of wire between its poles as shown in Fig. 26-*A*. The coil may be turned around the axis *X X*, and its terminals are connected to two rings *c* and *d* which rotate with it, so that by means of the brushes *e* and *f* they will be in connection with the heavy wire loop *F* in all positions of the coil. The lines of force due to the magnet, are shown running from the north pole to the south pole in dotted lines. Now suppose the coil is rotated around the axis *X X*, so that its top travels away from the observer and the bottom towards him. The wires on the top of the coil will cut the magnetic lines of force as the coil is turned, while the wires on the bottom of the coil will cut the lines of force in the opposite direction.

An application of Fleming's rule for determining the direction of current flow in a wire cutting the lines of force of a magnetic field, will show that the current in both the top and bottom wires of the coil will travel so that they will be combined and will leave the coil through the ring *d* and the brush *f* as shown by the solid arrows. The same rule will show that the current in the coil as it flows through the complete circuit, will travel in such a direction that it must enter the coil by the brush *e* and ring *c*. When the coil has turned half around, however, another application of the same rule will show that the current now travels in the contrary direction through the coil, rings, and brushes to the loop *F*, as shown by the dotted arrows. This complete series of changes will occur twice in each complete revolution of the coil around its axis.

The current flowing in the loop *F* will be an alternating current. If the coil rotates 1,000 times per minute—which is about the speed of the hand generator in a magneto telephone—the current will be reversed 2,000 times per minute or 33⅓ times per second. It is clear that, after making two complete reversals for each revolution, the current will begin the same series of changes again by flowing in the same direction as it did when the rotation of the coil was started.

83. *Frequency of alternating current.* The number of complete sets of alternations from any one starting point to the same starting point in the next set, completed per second, is called the frequency of the current. In the illustration used, the frequency would be 16⅔ cycles per second. Cycle in this sense means a complete series of changes in direction and strength. A cycle is the time required for the current to reach the same value traveling in the same direction as obtained when it started.

The reader should take Fig. 26-*A* and make his own application of Fleming's rule to determine the direction of current in the coil throughout a complete revolution around its axis. It should be borne in mind that the current does not suddenly change in direction, but gradually increases in one direction until it reaches its maximum, or greatest strength in that direc-

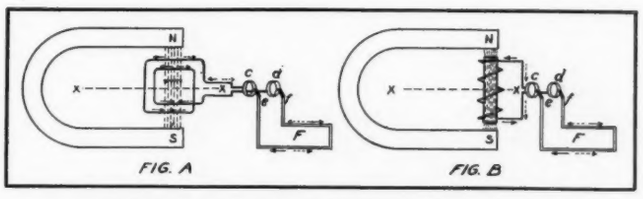


Fig. 26. Production of Alternating Current.

tion, when it begins to decrease gradually in strength until it ceases to flow. It then starts at once to increase again in the reverse direction, gradually reaches its maximum in that direction and becomes of gradually diminishing strength until it ceases to flow, after which it starts the same series of changes again for another cycle. This is assuming that the coil continues to rotate at uniform speed of rotation on its axis *X X*.

We know that if an iron core be placed in the coil, the number of lines of force threading the coil will be greatly increased owing to the increased permeability of the magnetic circuit. Suppose that the coil is fitted with an iron core and rotated in the same way as it was supposed to be rotated in Fig. 26-*A*. This condition is represented in the sketch shown in Fig. 26-*B*. The effect is exactly the same as the effect obtained with the coil less the iron core, illustrated in Fig. 26-*A*, except—and this is most important—that the number of lines of force threading the coil as it rotates is much greater in all of its positions than it was in the corresponding position of the coreless coil of Fig. 26-*A*. This is due to the greater permeability of the magnetic circuit through the coil. It means that the voltage of the current produced in the coil with an iron core as it rotates will be much higher than the voltage produced in the same coil without a core.

(*To be Continued*)

Convention of North Dakota Association.

The ninth annual convention of the North Dakota Independent Telephone Association, held in the Commercial Club Rooms, Grand Forks, N. D., March 24 and 25, opened its first session Wednesday morning with over 100 in attendance.

A cordial welcome in behalf of the city was extended by Mayor James Dinnie. A response in the association's behalf was made by C. H. Coar, of Minot, after which President L. D. Richardson delivered his annual address.

President Richardson emphasized the importance of cooperation between the public and the telephone companies. The public, he said, is willing to pay a fair rate for good service and it is up to the telephone companies to meet their needs. He also suggested a number of ways in which the telephone business could be improved.

Following President Richardson's address, a brief discussion was held on the matters brought out by him, and a number of further suggestions for the betterment of conditions in the field were presented by some of the members of the association.

C. H. Coar then presented the report of the publicity committee. After an informal discussion the morning session adjourned.

At the afternoon session Hon. Tracy R. Bangs, of Grand Forks, delivered an address, as did also Hon. W. H. Stutsman, of Mandan, president of the North Dakota Railroad Commission. E. Hamilton, of Page & Hill Co., Minneapolis, Minn., delivered an illustrated lecture on "Pole Preservation." He traced the pole through its various stages, showing views in the woods illustrating the cutting, hauling, shipping of the poles and the company's storage yards.

The Thursday morning session opened with an exceedingly interesting and instructive address by M. E. Young, engineer for the North Dakota Independent Telephone Co., Fargo, on the subject of "Engineering for Small Plants."

Following Mr. Young's address, A. S. Kelly, of Omaha, Neb., general traffic superintendent of the Northwestern group of Bell companies, spoke on the topic "Traffic." Among other things, he told how to best operate an exchange and distribute the business in a most efficient manner.

At the afternoon session, F. L. McVey, president of the University of North Dakota gave an interesting talk on "Taxation as Applied to the Telephone Industry." He was followed by Dr. A. Hoyt Taylor, of the physics department of the state university, who addressed the convention on "Radio Communication," accompanying his address with practical demonstrations of wireless communication.

The remainder of the afternoon was occupied with the reports of the various committees and the elections of officers. The officers chosen for the coming year are as follows: L. D. Richardson, of Fargo, president; W. H. Wilson, of New Rockford, vice-president, and H. A. Livermore, of Fargo, secretary and treasurer. New Rockford was chosen as the next meeting place for the convention.

A number of manufacturers were present with exhibits of new and improved apparatus, which attracted considerable attention.

The annual banquet was held Thursday evening in the assembly room of the Commercial Club, after which the members and visitors witnessed a play at one of the local theaters.

Standardization Committee of Independent Association.

The committee appointed at the annual convention of the Independent Telephone Association of America, for the purpose of establishing standards applicable to Independent telephony, had its first meeting in the association rooms, Chicago, March 22 and 23.

The committee consists of W. H. Hay, service engineer, Western Pennsylvania Independent Telephone Association, Pittsburgh, Pa., chairman; A. J. Seymour, engineer, Tri-State Telephone & Telegraph Co., St. Paul, Minn.; A. J. Shands, traffic manager, Kinloch Telephone Co., St. Louis, Mo.; J. M. Storkerson, superintendent, La Crosse Telephone Co., La Crosse, Wis.; W. J. Melchers, general manager, Union Telephone Co., Owosso, Mich.; F. O. Cuppy, general manager, La Fayette Telephone Co., La Fayette, Ind.; and Carl Sherrer, engineer, Keystone Telephone Co., Philadelphia, Pa.

Various methods of procedure were discussed, as were also the particular branches of the industry requiring urgent attention.

The committee decided to devote its attention first to the various phases of transmission. After discussing the component parts involved, it was deemed advisable to invite engineers representing the manufacturers of central office and substation apparatus and get their views and suggestions regarding standards of transmission. As sponsor of the idea, H. D. Currier, chief engineer of the Kellogg Switchboard & Supply Co., gave the committee his views regarding the scope of the work, stating that while work at first must necessarily be slow, immeasurable benefit will be derived from established standards.

The committee adjourned until April 23 and 24, at which time manufacturers' engineers will be heard and work will begin in earnest.

It is intended to outline the work so as to establish standards relating to toll transmission and connections to apparatus operating in smaller exchanges which heretofore have not had the advantages of special engineering.

Officers of Key West (Fla.) Automatic Company.

The Automatic Telephone Co. which was recently organized to construct and operate an automatic telephone system in Key West, Fla., has elected officers as follows: Dr. John B. Maloney, president; W. D. Cash, vice-president; T. A. Lumley, vice-president; Eugene W. Russell, secretary; Chas. R. Pierce, treasurer; A. S. Metzner, general manager. The officers together with Dr. C. F. Kemp, E. F. Tynes, Louis Wolfson, W. H. Towles and Geo. W. Reynolds constitute the board of directors.

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities and Actions of City Councils Bearing Upon Franchises, Rates and Service

Governor May Urge Telephone Probe in Massachusetts.

Governor Walsh of Massachusetts is understood to be considering sending a special message to the legislature recommending an investigation of the rates and service of the New England Telephone & Telegraph Co. As reported in last week's issue, the public service commision has submitted an extended report to the legislature recommending an appropriation to enable it to conduct an exhaustive study of rates and service matters, the appropriation for the routine work of the telephone and telegraph bureau being insufficient for this purpose. The House referred the report of the commission to the committee on mercantile affairs and the matter then went to the Senate on a question of concurrence. By a voice vote last week, the Senate refused to concur with the reference, and this action threw the report back into the House, where it now reposes in the files of the clerk.

The action of the Senate does not mean that all avenues for an investigation have been closed. The committee on mercantile affairs still has before it a portion of the governor's inaugural calling for an investigation of similar nature, and even if the governor does not send a special message at this time, it will still be possible for the committee to recommend an investigation based on the inaugural.

Since the establishment of rate schedules by the highway commission several years ago, many attempts have been made by the public to secure changes in telephone rates, and it is believed that a thorough investigation by the commission would lead to the establishment of telephone rate-making principles on a comprehensive basis which might be of value as a precedent elsewhere.

Hearing on Physical Connection Before Canadian Board.

The Canadian Independent Telephone Association representatives recently secured a hearing at Ottawa before the board of railway commissioners of Canada for the purpose of securing the incorporation in an order by the board, of the terms and conditions in which judgment was rendered by them in July, 1914. The entire board was present, and the Independents were represented by H. D. Gamble, as solicitor, Andrew Denholm, of Blenheim, president of the association and president of the Blenheim & South Kent Telephone Co., G. W. Jones, of Port Hope, ex-president of the association, and president of the Port Hope Telephone Co., and Alpheus Hoover, of Green River, president of the Home Telephone Co.

Clause No. 6 in the order was agreed on, which provides that "the Bell company shall, on application of any municpal corporation, Independent telephone company or system, connect its long distance telephone system or line with the system or line of any such municipal corporation, Independent telephone company or system, unless otherwise ordered."

This clause therefore lays down the conditions for the Bell giving free connection to non-competing companies, and to non-competing parts of competing companies, the same as between parts of the Bell's own system.

It is provided that any surcharge or other charge for the ordinary long distance tolls shall be paid by the Bell company to the municipal corporation, Independent company or system which is non-competing, only for districts which are agreed to be non-competing and are found by the board to be so.

As for competitive companies, in regard to section No. 7, on which there was considerable difference of opinion, the Independent companies contend that telephone companies are all common carriers. There was no agreement between the Independents and the Bell representatives, and on this clause the board reserved judgment. The contention of the Bell people is that in the case of competing companies and systems, each such competing company or system, as compensation for loss of the Bell company and as a factor of convenience to the subscribers of the Independent company or system, shall pay to the Bell company the following annual charges, payable half-yearly in advance from the date of connection: $100 for a system of not more than 250 subscribers; $200 for one of 250 to 600 subscribers; and $300 for one of more than 600 subscribers.

The Independents contend the number of subscribers in non-competing parts should be deducted. The Bell people state that all subscribers should be counted whether in competing or non-competing districts.

The Independents want connection at points selected from a geographical regard for convenience. On this point, too, decision is reserved by the board.

The Independents contend that every company should connect for local and long distance business without compensation. On this point the board reserved its judgment.

Mr. Gamble, for the Independent companies, is appealing against the judgment, particularly on the basis of the interpretation of the word "compensation."

The Bell people claim to be entitled not only to an extra fee for switching, but to a cost payment for loss incurred. The Independents contend there is no loss, any more than in the case of other carriers, but might admit the reasonableness of a switching charge.

New Franchise for Spokane Drafted by Mayor.

Acceptance by the Pacific Telephone & Telegraph Co. of a new 15-year franchise, provided for in an ordinance introduced by Mayor C. M. Fassett at a recent legislative session of the city council, will carry with it the surrender and cancellation of the Home franchise, running until 1940, under which the local system and plant of the Pacific company are now being operated.

The grant also binds the company, on its acceptance, to submit to the fixing of rates by the city at any time during the 15 years, that the power so to do may be given to cities of the first class. It concedes the power of the public service commission to fix such rates at present, however, and specifies only that the company shall not increase its charges for service in Spokane until ordered by the commission to do so.

Provision is made in the ordinance that the city reserves the right at any time to take over the telephone company's local holdings upon its payment of a reasonable price to be determined by a board of arbitrators, two members of which shall be chosen by the company, two by the city, and the fifth by these four or by the superior court judges in case the four are unable to agree upon the fifth arbitrator.

In practically all other respects the ordinance is the same as the 25-year grant given by the council and accepted by the company, but rejected by the people at the last election, except that it would bind the company to pay a franchise tax of 1 per cent. of its gross receipts throughout the entire 15 years, instead of increasing the percentage ¼ per cent. each five years. Like the 25-year franchise, it pro-

vides that the company shall give the city free use of 100 telephones.

The ordinance is favored by all members of the city council with the exception of Commissioner Fleming, it is claimed, the purpose being to avoid litigation in the present telephone franchise tangle if possible.

Mr. Fleming is going ahead with his work of gathering data concerning the situation to lay before the United States attorney general, in the hope of having set aside the modified decree of the United States district court under which a merger of the Pacific and Home systems under the name of the Pacific Telephone & Telegraph Co. was permitted before the people rejected the Pacific company's franchise.

He continues to hold that the Pacific company's action of turning its holdings back to a reorganized Home company, after it had acquired all the stock of the old Home company, in order that it might operate under the old Home franchise, which it agreed to cancel as a consideration for the right to effect the amalgamation, was a "fraud upon the courts and upon the people."

Publication of the new compromise franchise was authorized by the city council preliminary to its consideration the latter part of April. In the event that a referendum is filed, the telephone company is not required to present an acceptance of the franchise until after the matter is submitted to the people and approved by them.

As reported in a previous issue of TELEPHONY, the Pacific company recently turned down a 10-year grant, with rates fixed by the city, reiterating a former assertion that it would not accept a franchise less favorable than the one rejected by the people last November.

Minnette Bill Non-Concurred in the Minnesota House.

The Minnette bill, which, as reported in last week's issue of Telephony, was passed by the Senate with several amendments, was non-concurred in the House, and placed in the hands of a joint conference committee.

A lively debate ensued regarding the referendum clause of the bill, which was eliminated by the amendment of the Senate. Representative Minnette insists that the referendum feature be retained and asked for the appointment of a conference committee.

Utah Public Utilities Commission Bill Killed.

The Utah state senate recently killed Senator Evans' bill providing for the creation of a public utilities commission for the state of Utah, after the advocates and opponents of the measure thoroughly discussed it on the Senate floor. The opponents in the measure took the position that no condition existed in the state which made such a commission necessary.

Ohio Physical Connection Bill Passed By House.

The bill introduced by Representative Oberlin, of Stark county, which provides that telephone companies must grant interchange of service whenever public convenience demands it and the physical conditions required will not irreparably injure owners, was recently passed by the House of the Ohio legislature. The bill is now before the Senate for consideration.

Summary of State Commission Hearings and Rulings.

CALIFORNIA.

March 19: Hearing on petition of citizens of Corona, Cal., to have the rates of the Corona Union Telegraph & Telephone Co. lowered.

CANADA.

March: Hearing at Cobalt, Ont., in regard to application of the Temiskaming Telephone Co., Ltd., of New Liskeard, Ont., for revision of rates and service.

ILLINOIS.

March 23: Tamaroa Telephone Co.; W. C. Zilm, doing business as the Lee Rose Telephone Exchange; Milledgeville Mutual Telephone Co. and the Clayton Farmers' Mutual Telephone Co. given permission to change rates and remove discrimination.

March 23: The Mt. Carmel (Ill.) Telephone Co. given permission to increase switching rates from $2 to $3.50 for rural lines.

INDIANA.

March 23: Hearing in regard to petition of the Farmers Mutual Telephone Co., of Columbia City, Ind., for an order compelling the Central Union Telephone Co. and the Pierceton Telephone Co. to connect with its lines for toll service. Until five years ago the Farmers company did have connection with the Central Union company, the complainants allege, but at that time, for no apparent reason, it was cut off.

April 5: Hearing in regard to application of the Cumberland Telephone & Telegraph Co. for permission to sell its Indiana property to the Southern Telephone Co. of Indiana.

KANSAS.

April 1: Hearing on application of A. J. Stephens for permission to lease his telephone plant at Horton, Kan., to the Northern Kansas Telephone Co., which also operates a telephone plant at Horton, and to consolidate the two plants and fix rates.

MARYLAND.

March 31: Hearing on the investigation of the Chesapeake & Potomac Telephone Co. in the state of Maryland.

MONTANA.

March 20: W. E. Carroll, of Butte, Mont., has filed a complaint against the Mountain States Telephone & Telegraph Co., alleging that the telephone company has increased its rates in Butte over the schedule on file with the commission and that the increase is unjust and discriminatory.

April 3: Hearing at Laurel, Mont., in regard to complaints of residents of that town and vicinity against the rate and toll charged by the Mountain States Telephone & Telegraph Co., which the complainants allege are unreasonable and discriminatory.

NEBRASKA.

April 14: Hearing in regard to application of the Monroe (Neb.) Independent Telephone Co. for permission to issue $15,000 worth of stock.

NEW YORK.

March 30: The commission has formally entered the order reducing telephone rates in New York City, as announced in last week's TELEPHONY, whereby an estimated saving of $3,000,000 will be effected for subscribers. According to the order, the rates are made effective for a period of three years, beginning July 1, 1915, and the rate of return is fixed at 8 per cent. The company is required to file acceptance of the order within ten days.

OHIO.

April 20: Hearing in regard to the protest of the Lima, Ohio, city council against the rates, service and legality of the Lima Telephone & Telegraph Co.'s action in raising its charges above those specified in the franchise ordinance of 1895.

OKLAHOMA.

March: Purcell Telephone Co., Purcell, Okla., granted permission to increase its rates from $1 to $1.25 per month. This order is the result of a petition filed by the company X, in which 77 of its subscribers joined, to allow the increase on the ground that the company had gone to considerable expense in improving the service.

March 31: Hearing on complaints filed by Independent telephone companies of Oklahoma against the Pioneer Telephone & Telegraph Co., charging that the Pioneer company is making threats or actually removing its toll line connections as a means of forcing the complainants to sign contracts for a division of long distance receipts more generous to the Pioneer than the Independent companies agree to concede.

PENNSYLVANIA.

April 6: Hearing in regard to complaint of the city of Pittsburgh, Pa., against the Central District Telephone Co., in regard to rates and service in the Pittsburgh district.

WASHINGTON.

May 15: Hearing on the valuation of the properties of the Pacific Telephone & Telegraph Co. in the state of Washington. On the valuation to be fixed, as a result of this hearing, telephone rates, both for exchange and toll service, will be based.

WISCONSIN.

April 15: Hearing in regard to application of the Colfax Telephone Exchange, of Colfax, Wis., for permission to raise rates.

Fundamental Principles of the Telephone Business

A Reading Course Designed to Present Logically the Principles Which Underlie Successful Organization and Operation of Telephone Properties —Prepared Under the General Supervision of Stanley R. Edwards—This Section on Economics of Telephony written by James H. Shoemaker

Quiz Questions on the Preceding Installment.

7. What five terms must be dealt with in the consideration of telephone economics?

8. What is the meaning of economy as related to political economy?

9. With what does theoretical economics deal?

10. What is the meaning of "practical economics."

11. What principle serves as a foundation upon which all departments of economics can stand.

12. Give a reason for separating utility economics from practical political economy.

13. Why should a utility man expect to have his business regulated by public authority?

14. Why is it an honor to be regulated?

15. What is the meaning of utility? As a matter of self-preservation, what must telephone men do?

16. Why is applied economics a matter of great concern to the telephone utility?

CHAPTER ONE. Introduction (Continued.)

17. *Telephone's Economic Value and Commercial Cost.*—A man is not helping to win a boat race unless he is pulling at his own oar with more than enough strength to move forward the dead weight of his own body. A man is not helping the human race in its struggle for peace and prosperity, unless he is putting into life more than he takes from society. An organized undertaking is of no value unless its economic value to the people as a whole, is greater than its commercial cost.

The damage suits which patrons sometimes file against telephone companies, for alleged failure to give service, perhaps furnish the best evidence of a material kind that can be given, of the enormous difference between the value and the cost of telephone service. An instance comes to mind where one patron brought suit for $5,000 against a telephone company. He claimed that the telephone operator did not use due diligence in hunting for him at the golf links of the country club after she had failed to get him at either his office or residence. He claimed that if he had received that one "call," it would have meant a $5,000 profit.

It has previously been pointed out how exceedingly necessary it is for the utility man to know every economic justification of his business. Our schools and our political parties—even our churches and philanthropies—are being called seriously to account. Here, for instance, is a paragraph from an editorial in a daily paper of nation-wide influence:

"New York's charity organization spent $143,292 in salaries last year, and $90,115 in relief work. In New York, charity not only begins at home, but shows a disposition to stay there."

The writer of that editorial may have been mistaken. Possibly there were good reasons, as the head of the organized charities of Chicago has undertaken to prove, for this suprising disproportion in the figures which called forth this sarcastic remark. There is no inclination at this time to criticize either the charity workers of New York or the writer of this censure. The incident is cited merely to show that even privately sustained charity can become so general as to call forth the same kind of investigations and criticisms that are lodged against utilities.

Every utility needs to be ready to give the most complete and reliable reason possible for its existence. Every telephone man needs a schedule of his economic justifications fully as much as he needs an inventory of his materials on hand or an appraisal of his plant. He cannot afford to leave the smallest item out of his list of justifications, any more than he could afford to leave an item of money value out of the appraisal upon which the physical valuation of his property is to be based for rate-making purposes.

The tremendous money value of telephone service, to the average telephone user, has already been hinted at, but it needs to be considered more thoroughly. Few patrons use their telephones less than three times daily. At the rate of ten cents a trip for messenger service this would cost 30 cents a day, $9 a month, or $108 a year. The cost for time used in writing and for stationery would be fully as much more. Often the distance is so great between those who telephone in cities or from villages to farm homes in the country, that it would cost 25 cents, 50 cents, even a dollar, if a boy were employed to carry a written message. In the case of long distance communications, the disproportion between the toll rate and the cost of a special messenger is much greater.

It is not possible, however, to obtain or make a reliable estimate as to the exact additional amount that a telephone user would be compelled to pay out if he were denied the use of his telephone. Many of his present communications would not be made at all. In many instances the traffic would not bear even the cost of so much as the time required to write the messages.

The economic value of the telephone to the public in general is incomparably greater than the sum total of its value to specific patrons. Remember that according to the teachings of practical economists, the public has a superior interest in all economic values—as has been shown in the case of opium and lottery tickets. The public's interest is so great that no private interest, claim, or desire may be set up against it. There is an economic interest which outweighs any and all claims of private convenience, private necessity or private advantage.

Telephone men need to remember that this superior interest of the public in economic values is the thing that prevents them from charging all the traffic will bear. This greater interest of the public is the only thing that prevents telephone men from doing the same as do those who are engaged in businesses not yet declared by law to be utilities.

18. *Telephone as a Unifier of the Public.*—It is in the unifying of the public, therefore, that the great economic value of the telephone is found. Consider, if you will, this fact of history. In an early day one of the leaders of thought objected to the annexation of that region which is now known as Oregon and Washington. He argued that the distance was so great that if an election were to be held at the same time throughout the nation, those elected to Congress from Oregon and Washington would never be able to get to the Capitol City (Washington, D. C.) until after the adjournment of Congress. By means of the telephone the President at Washington, D. C., can now talk to the governor of California as conveniently as if the two were in the White House.

The line of real progress lies in the direction of harmony among many, without dictatorship from any source whatever, except that which is fully conceived and freely conceded to be the dictatorship of right and courtesy. The telephone tends more persistently than does any other agency, to bring into every day practice all the principles which are already conceded to be right. It tends also, more persistently than does any other force, to bring to light such principles as need to be recognized and put into practice for the further unification and development of organized society. "Just as the click of the reaper means bread; the purr of the sewing machine, clothes; the roar of the Bessemer converter, steel; and the rattle of the press means education, so the ringing of the telephone bell has come to mean unity, organization and advancement."

19. *True Value of Telephone.*—The telephone is man's greatest economizer. It is only when an exchange building burns or some other calamity compels a community to get along for a time without telephone service, that its true value is appreciated. It is because water is so cheap and so plentiful that "we never miss the water till the well runs dry."

If we could imagine some change in the forces of nature by which this mysterious thing called electricity would refuse to do in the future any of the things it has been doing in the past, or if we could imagine doing away with telephones entirely, for all time to come—then, and then only, would we get a true glimpse of the incalculable economic value of the telephone.

20. *Quantity, Quality and Cost.* It is useless to talk of the cost of telephone service unless the other two elements—quantity and cost—are taken into the account at the same time. Many people still have the idea that about all the telephone company has to do is what can be seen by the consumer of the service as he uses his telephone. It would be well if we might have a true photograph of the mind of the people as a whole with regard to telephone service. In all probability it would show that the average man sees no more in the way of material substance, or human attention, than the instruments of the two talkers. He probably is conscious of no more than would be required if each owned a private wireless station, and the talk were of the "wireless" variety.

Even more, there would be a consciousness of the cost of the power if they were talking wireless. The way matters now stand, telephone patrons have no sense of obligation for the cost of power.

It would be better if the people, as a whole, might have a true picture of the property and the personal attention required every time any one talks by telephone. The patron always sees the clerk who "waits on him" at the store. He always sees the waitress who attends to his needs at the restaurant. He always sees the agent who waits on him during the rush at the ticket window just before the departure of the train. Suppose a moving picture might be made to appear in front of the patron every time he takes his receiver off the hook and that it would show every dollar's worth of property and every act of man that is brought into use as the patron gets his connection with the other party. If a moving picture of this kind were to appear before every patron every time he talked by telephone, the solution of the psychological problem of the telephone man would be much easier.

The next best thing to having that kind of a moving picture appear every time the receiver is taken down, would be that every telephone man have a complete mental picture of the necessity of informing the public concerning every element of the cost of the service.

Dean M. E. Cooley, of the Michigan University, has well said that utility men, themselves, have been very slow in finding out all the elements of cost. Small wonder, therefore, that the patrons do not know.

CHAPTER II. Self Interests and Utilities.

21. *Economic Knowledge, Accurate Accounting and Personality.*—After all the elements of cost have been brought into account as minutely and as accurately as would be done if each were a cash entry affecting a trial balance, there still remains the task of impressing patrons, individually and collectively, of the fact that the economic value of the telephone is infinitely greater than its commercial cost. Success in convincing the public, as to this difference, will depend upon three things: The completeness and fairness of the figures; the economic comprehension of the telephone man, himself, who presents the figures and facts to the public; and his personality.

"Suppose there were in Washington a man who understood figures as well as did Gladstone, business as well as Carnegie, and human needs as well as Lloyd George. Whither would his leadership drive?" asks Norman Hapgood in a recent number of Harper's Weekly. We are approaching the day when a majority of the telephone companies will have some such combination as that in their managers.

Some men depend upon the powers of their personality, without either figures or economic knowledge. Others rely upon figures without personality or knowledge of economics. Still others rely upon figures, without personality or schooling in economics. In placing the telescope or magnifying glass upon the economic interests of the business, we would make a fatal mistake if we suggested that any one

should rely upon economic comprehension without figures or without the personality. Each one of the three is *efficient,* but no one of them is sufficient without the strengthening support of the other two sides of the triangle.

22. *Interested Parties in Telephone Properties.*—Almost without exception the telephone properties of today are privately owned. Furthermore, the interested parties will sustain practically the same economic relationship to each other even though, at some future time, the theory of public ownership is put to the test. The theory of public ownership will be referred to in another portion of this course.

There are three interested parties: The self-interested producer; the self-interested consumer; and, the general interest of the people as a whole. The last mentioned includes the private interests of both producer and consumer, of course, but it includes also and more particularly, the greater interest which everybody has in the meting out of justice and in the encouragement of every industry which has economic value or which advances civilization.

As previously mentioned, Dean Cooley calls attention to the fact that the people do not understand, nor take into account, all the elements of cost when thinking about or dealing with utilities. Even utility men, themselves, have been in the habit of leaving out certain very important elements of cost. There is an oversight on the part of the people, as a whole, and on the part of utility men that is much more serious. The people have failed to see that personal or private interest as interpreted by most consumers is as much opposed to the common good, as is the personal or private interest of producers. They have failed to see that the buyers of telephone service, for instance, are just as self-interested as are the sellers. Even utility men, themselves, have failed to catch the full meaning of this.

The most serious thing about this oversight is that the leaders of sentiment are, if possible, more blind than the men of the utilities. They seem to have failed, utterly, to see that, individually and collectively, it is natural for consumers or buyers of utility service to show just as much self-interest as is shown by the producers or sellers.

As consumers of railroad transportation we, as a whole, are showing ourselves to be more or less selfish and vindicative; whereas, everybody knows that no justice-loving or justice-seeking public can be either selfish or vindicative. On the whole, we, the buyers of the product of the railroads, are showing more or less of a desire to "get even," but no justice-loving nor justice-seeking public can undertake to get even in that sense. No real public will ever attempt a reprisal. Admitting that, in some instances, railroads have done wrong, no real public will ever attempt to return evil for evil, or seek revenge. It must be confessed that we, the people as a whole, have not yet risen to the point where we show appreciation in a practical way for the public interest—at least where the self-interest of a majority runs counter to public interest.

23. *People and Public Interest.*—There may be some who would say that the interest of a majority of buyers or consumers is the interest of the public, but that is not the correct statement of the case. On the contrary, that is where one of the most serious mistakes is being made. This distinction will be made more clear in a later section. Before leaving this feature of the subject, let it be remembered that the people, as a whole, in the past have not always been able to show appreciation for the best interest of the public. Let us face the fact that the public crucified the most Perfect Public Servant that the world has ever seen. It should not be forgotten that this Perfect Servant tried to bestow benefits upon the great city of his day. He was so seriously repulsed that, in sorrow, he said of his "public": "How often would I have benefited you, but you would not permit yourselves to be benefited. You would not accept that which was for the common good." Let us not forget that the Perfect Public Servant was talking about the leaders of the prevailing sentiment of the hour when he said: "Forgive them, for they do not know any better."

We must face the fact that from one point of view this kind of a "public" is neither practical nor ideal. For their own self-protection, therefore, utility men must make all the people see that unless we can build up a justice-loving and a justice-seeking public, civilization will be unable to proceed. As a people, and more especially as telephone men, we must face the fact that neither publicly-owned nor privately-owned utilities can be controlled properly by self-interested consumers. On the contrary, there must be a strong enough public to hold the balance of power against the self-interest of consumers no less than against the self-interest of the producer.

24. *Self-Interest Erroneously Called Public Interest.*—It will not benefit the public any more than the utilities to dodge this fact that as yet it is largely the self-interest of the buyers of utility service that is being spoken of, erroneously, as the public. How can there be such a thing as a real public as long as a majority of telephone managers, for instance, think about and speak of the public and the consumers of their service as one and the same? How can there be a practical public as long as telephone men, themselves, damn the other utilities as hard as they are damned by anybody? If, as telephone men, we scold about the railroads as though no difference existed between the best managed and the worst managed railroad, how can there be any such thing as a real justice-seeking public?

Imagine a father who has ten sons, nine of whom are known to be loafers and pilferers, while the tenth is honest and hard-working. The father comes home vexed, gathers up the horsewhip and unmercifully punishes the entire ten, meanwhile saying that a majority of them are wrong and that they must be punished as a whole. How many of the telephone men of the reader's acquaintance have this attitude toward the railroads?

Now, if telephone men are not capable of turning the sentiment of the so-called public in the direction of justice for the railroads, should we expect the railroad men to demand justice for telephones? If we fail to fight for justice for the railroads, who should be expected to fight for justice for telephones? To be sure, the telephone man is a self-interested patron of the railroad. But if he cannot rise far enough above his private or personal self-interest

to demand justice for that road which corresponds to the honest, hard-working son, how can he expect any one of the self-interested buyers of telephone service to act as though they were a part of a justice-seeking public?

As telephone men we have a self-interest that is shared by the men of all the other utilities. It's a common self-interest in the upbuilding of the justice-seeking spirit of the people as a whole. Of what value to any utility is a public that does not have the pursuit of justice for its highest aim, or fails to encourage the best that can be found in every necessary line of human endeavor?

We have three economic interests: The self-interested seller; the self-interested buyer; and, the disinterested public. But the disinterested public must be made over into a *justice-seeking* public before the economy security of the telephone industry can truthfully be said to have been completed.

Until the public shows that its supreme interest is in justice, there is no disinterested agency to serve as a referee of the differences which arise between the sellers and the buyers of telephone service.

(*To be Continued*)

Practical Subjects—Letters and Discussions

Another View of the Farmer Question.

I have read Mr. Martin's letter, in the March 20 issue of TELEPHONY, to the proposed farmers company. For the farmers, it sounds like a very discouraging document—but will it work that way? I doubt it. I have had to deal with the farmer for past 16 years, and find him a very human personage, more suspicious than the average and much inclined to haggle. But underneath, he is like the rest of us, and I believe Mr. Martin's letter will act as a booster toward the formation of this farmers company.

As an opposite extreme from Mr. Martin's horrible example, I want to relate, briefly, the history of a telephone company which operates as a neighbor to ours. It has been in business since 1896, and now has five exchanges in Trumbull and two in Ashtabula county. All but one of these are in very small towns. Fully 50 per cent. of the 1,500 telephones are on rural party lines—all full metallic circuits of No. 12 B. B. iron wire. The rate is $15 a year and dividends that average more than 5 per cent. have been paid for each year.

For the last seven years the company has passed through the most severe farmers competition and some 25 farmer companies now operate in its district. One exchange was almost cleaned up, yet in face of this the company went bravely ahead. As matters now stand it has made a 5-cent interchange service with most all the farmer companies and in many cases are getting some of them back as subscribers. The company is in the telephone business and gives a good clean service, well maintained, while many of the farmer companies have grounded systems, poorly kept up with the resulting poor and unreliable service.

Most all these farmer companies are now renting service at $12 a year to parties who will not join their associations. With our public utilities law, as now drawn, it is a question whether they are not now compelled to charge $12 to everyone alike, members of their associations or not. There has been no decision made as yet by the state commission.

Our own company serves 300 rural subscribers from the Warren exchange on full metallic lines of No. 12 B. B. iron wire. Ten-party, full selective ringing, common battery service is furnished at $18 a year, less 25 cents a month if paid before the 15th. We also have a rural exchange of 150 subscribers with 12-party magneto service at $15 a year, net. We think the earning power is just as great on this sort of service as on our city service (five-party selective) where the expense of construction, all cable, is so much more per telephone—so we beg leave to dissent from Mr. Martin's statement.

The farmer needs telephone service and the telephone company needs the farmer's business. We feel that every new rural subscriber adds to the effectiveness of our city service, many times. This can be directly traced in new city subscribers when they can reach their country friends or relatives in rural districts.

Moral (apologies to Kelsey): Every telephone exchange has a natural area tributary to it. That area does not stop at the city limits, and the people in that district must be supplied with service. The more you get of them, the stronger your company. Can we dodge our duty? We doubt it.

E. G. Miller, General Manager,
Warren, Ohio. The Warren & Niles Telephone Co.

A New York Development.

By Garrison Babcock.

Every operating telephone man is said to have an inborn horror of telephone attachments, and with the Bell company, today, there is a first commandment—"Remove attachments." Years ago it was supported by the United States Supreme Court in its acts of destruction against all makes of "foreign telephones," whether connected to Bell lines or not, the definition of the word "foreign" being "not manufactured and leased under Bell patents." However, the same Bell telephone company today embraces within its ranks no less than three million telephones manufactured by Independents. Nevertheless, instances are rare where local Bell lines connect with other than Western Electric (Bell licensee) instruments. The obvious reason is the maintenance of an exclusive market for its own goods.

The Independent manufacturers have viewed this practice in silence, depending upon their customers (the Independent operating companies) to return the compliment. How wise this course has been in the past is for them to say, but from the Bell annual report, it would appear that the Western Electric Co. is operated under the policy of selling to Independents, with the Bell companies not buying from Independents.

Thoughtful men have pondered on this situation and have expressed themselves as satisfied that the Clayton and Trade Commission bills will cause the abandonment of this unfair practice.

A subscriber of the New York Telephone Co. has taken issue on the question of "a standard" and demands that one be established in the interest of reasonable rates. Read the following:

REMBRANDT REALTY CO.,
3607-11 Broadway.
Joseph B. Marx, President.

New York, March 10, 1915.

Blank Independent Telephone Co.,
Chicago, Ill.

Gentlemen:

I suppose you are aware that the Public Service Commission for the Second District, whose office is at Albany, N. Y., has rendered a decision in the telephone matter, ordering the New York Telephone Co. to submit a reduced schedule of rates. Several other matters will finally be adjusted at the same time.

The Foley legislative committee has also made its report in an Independent telephone investigation and recommended to the legislature at Albany and to the Public Service Commission for the Second District, among other things, that a "standard" should be created for telephone instruments and the telephone company would be obliged to give service over such "standard" instruments.

I am a member of the telephone committee of the taxpayers' association which has prosecuted the telephone matter before these commissions. We are greatly interested in any law or ruling which will permit us to purchase or install our own equipment, especially extension telephones in the apartments, since we understand that the new rate will still be about $4.80 *rental,* per annum, for each set.

I am writing you this letter, urging you to engage counsel and in co-operation with us, to press this matter before the public service commission. Please address Senator James A. Foley at 66 Broadway, New York City, or at the Senate Chambers, Albany, N. Y., or at both places.

Yours very truly,
(Signed) Joseph B. Marx.

Another phase of the situation was illustrated in an article by A. P. Connor in last week's issue of TELEPHONY.

It would seem that there are several clouds which may be pierced by the establishment of a recognized United States standard for all common phases of telephone practice. Do not mistake the meaning of the word "standard"—call it for the sake of illumination, "Permissible Commercial Standard" to which instruments, inside wiring, cables, aerial lines, switchboards and methods of operation shall be maintained to afford a recognized commercial standard of service for which the public is paying.

The first direct result would be the legal basis for opening up the entire market for competition in the supply of materials. The next effect would be the more scientific basis for the establishment of rates by utility commissions.

The second result would be the possibility of transferring the entire substation installation and maintenance to the building owners and subscribers under rules which would protect the operating company. It would relieve them of a large part of their plant investment and remove entirely the losses resulting from rewiring to suit new tenants, instrument breakage and depreciation due to all factors which affect substation equipment. Under these conditions, it would be probable that the subscribers would install many more instruments for their interior convenience.

The question is a live one and both operator and manufacturer are involved. As in the past, it appears that the Independent industry is to be benefited in company with the public.

This is a matter which should have thought and discussion by both operators and manufacturers for the purpose of presenting to the entire field all of the views and deductions which may result from such thought and discussion. It should be taken up by both national associations.

One plan suggested is to call upon our Washington representatives to invoke the good offices of the United States Bureau of Standards in this matter, in co-operation with the leading telephone engineers.

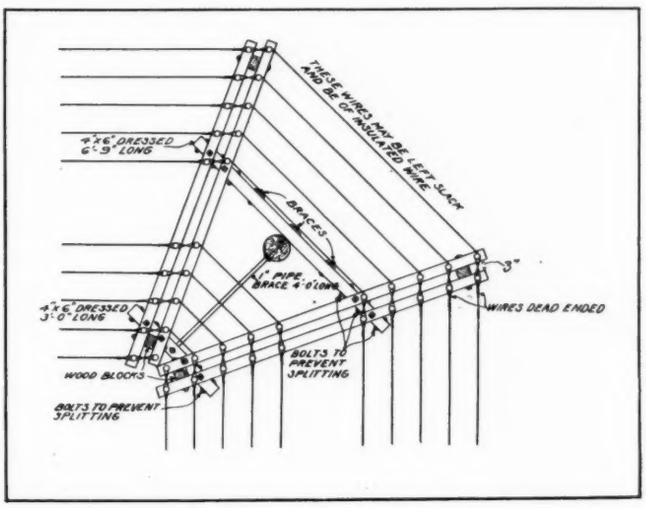
The writer would like to see some concerted action taken on a subject of such importance to telephone manufacturers, operators and users.

Substitute for Buck Arm—Selective Ringing Problem.

I read with much interest Uncle Dick's comment on the substitute for a buck arm on a square corner, which I sent in during December, and am sending a sketch of what I believe to be a cure for the one vital objection which he calls especial attention to, i. e., relieving the strain on the short spans between the arms.

His argument sounds very reasonable, but in this locality we have no very cold snaps, the climate being nearly an even temperature. We seldom have weather any colder than 20 above zero. I have examined the short spans and find them no tighter than when put up.

I would like to ask, at this time, if any of the readers of the issues of TELEPHONY containing the other designs for this purpose. I have been a constant reader of TELEPHONY for the past five years but do not remember the articles he mentions. Of course I might have missed them.



A Substitute for Buck Arms or Square Corners.

In the design published with his article, it would appear to me that there would be a tendency for the long ends of the arms to draw together and break the arm in two. Also it would seem that there would hardly be space enough between the wires with the arms no farther apart than they appear in the illustration.

I would like to ask, at this time, if any of the readers of TELEPHONY have ever used a selective ringing system on party lines, in which the ground was not placed on the generator permanently but made by the contacts of the reversing key. I am about to try out such a plan and if successful will send in the wiring plan of it. The object is to have the generator free from ground for ringing on bridging farmer lines where there are likely to be tree grounds and other leaks, possibly on the opposite side of the line from the grounded side of the generator, and which would interfere with the ringing of the bells.

Newport, Ore. W. G. Cumming.

New Features of New York City Directory.

In the latest New York City directory, which has just been issued, are listed 1,104,676 names covering the boroughs of Manhattan and the Bronx in its 2,656 pages. The pages have been increased in size so as to give room for five columns of type. In many instances the telephone numbers of citizens are given opposite their names. The resident addresses of professional and business men having offices in Manhattan or the Bronx are given, although they live outside of these boroughs. The names of copartnerships are followed by the names of the partners, those of corporations by the names of their officers and the state in which they are chartered.

Annual Meeting of Florida Telephone Association.

President W. G. Brorein has announced that the Florida Telephone Association will hold its annual meeting at Tallahassee, Fla., on April 22 and 23. The first session will be held on Thursday, April 22, at 3 p. m. An interesting program is being prepared which will be announced later. An invitation is extended to all who are interested in the telephone business to attend this meeting.

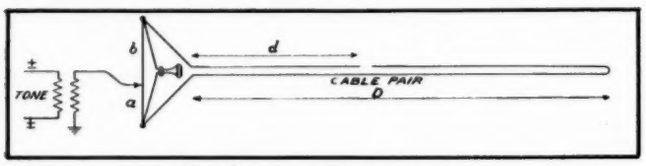
Queries on Theory and Practice

Locating Opens in Cable.

I wish you would tell me how to find an open in a cable. We have a cable tester and can find all other kinds of trouble but fall down on an open.

Measurements of relative capacity are the only practical way of locating opens or breaks in a cable. Even this method is only approximate, since the capacitance of cable wires is not strictly uniform.

The principle of most fault finders for locating cable breaks is that of a slide wire Wheatstone bridge with tone current



Method of Locating Opens in Cable.

(alternating current) in place of battery and a telephone receiver in place of the galvanometer. The accompanying sketch illustrates the principle. At the distant end short-circuit the bad wire and its mate, which must be known to be good. Attach the good wire to the *a* end of the slide wire and the bad wire to the other end. Ground one terminal of the tone producer so that the tone current will pass through the *a* and *b* portions of the slide wire in parallel through both wires, returning to the earth through the capacitance of the wires to sheath and earth.

Balance for least sound by moving the stylus along the slide wire. Since the shorter wire has the less capacitance, and the less capacitance acts like the higher resistance, *a* will be less than *b*.

The formula for the distance *d* to the fault is $d=\frac{2aD}{m}$

in which D = length of cable and $m = a + b$ = divisions of slide wire.

For those who like it, the above is derived from the equation

$$\frac{d}{2D-d}=\frac{a}{b}$$

Open Core Type of Coils for Induction Coils.

Will you please inform me why an open core type of coil is used in a subscriber's telephone set as an induction coil? Would a closed core type of coil, similar to a repeating coil, be more or less efficient and why?

The closed core type of coil is more expensive to make and does not give as crisp, clear transmission as the open core coil. There are very many telephones and relatively few switchboard cord circuits in any one plant. Hence the need for making the substation apparatus cheap. An induction coil with no iron at all (air core), gives the most crisp and clear transmission, but it is not loud enough. Hence, just enough iron is used to bring the loudness up to commercial value. The reason why iron is detrimental to clearness is that iron does not magnetize proportionally to the current; requires considerable energy to change the magnetic flux and has some eddy current loss.

High Tension Power Line and Telephone Circuits.

We have a six-wire lead (three circuits) of farm lines running two miles west, where it splits up, one pair going two miles farther west. A 13,000-volt power line comes along this road, building directly over our lead the whole four miles. The opposite side of the road has no pole line of any kind.

Now, when power is turned on the power line, our lines are so noisy that they cannot be used at all. The power wires were supposed to be five feet above ours, but in many places are not quite four feet. Is there any system of transposition that will keep the noise off these lines? Our lines are full metallic, but always have some ground on them from tree contacts.

The power line people claim that in case their wires broke and fell on our lines or were forced down on them without breaking, that their circuit breakers at their power station, 14 miles away, would prevent any damage to our line or operators. Is it probable or possible that circuit breakers can safeguard our lines?

Both for safety to your employes and the public and for possibility of commercial use, the power line must be on the other side of the road. The circuit breakers on the power lines will not protect your operators or lines. You are in peril all the time such conditions exist. If the power lines are across the road from you, your lines can be transposed so as to give good transmission.

Transmission Over Grounded Lines.

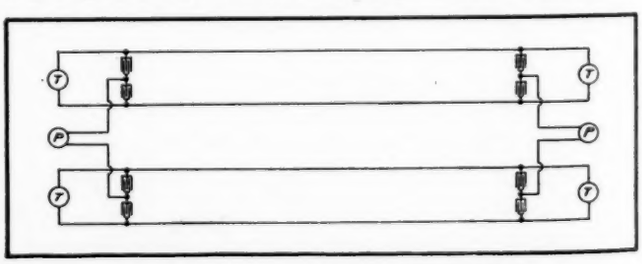
How far can one telephone over a grounded circuit, the wire being No. 9 iron? What would be the circuit that would give the best results; also how far over a metallic circuit of two No. 9 iron wires and give its circuit? What arrangement of circuits would give the best results in talking over a grounded line, 370 miles long, the wire being No. 9 iron?

To obtain the best results, use high grade local battery (magneto) telephones, with three dry cells on the transmitter. There should be just as few stations on the line as possible. Each telephone should be of the bridging type with 1,600-ohm bells. The distance which you can talk depends on the quietness of the line, the condition of the dry cells and telephones, the number of receivers off the hook along the line, the quietness of the rooms in which the telephones are located, and the voice and ear of the users. Since so many factors enter, you might talk fairly well over a 200-mile No. 9 B. B. iron line on one day and the next day find it impossible to understand. One hundred miles of metallic circuit iron wire is about all that can be used regularly. You might have exceptional conditions which would make it possible to talk 370 miles, but ordinarily it is not commercial. Very high insulation would be necessary.

Phantom Circuit With Condensers Not Practical.

Can a practical phantom be made with condensers? If so, please give diagram of connections and capacity of condensers to use.

We suppose that you refer to some such arrangement as shown in the accompanying sketch. It is not practical. The necessary size of the condensers would cause them to be a great leak to current on the physical circuits, greatly reducing their transmission efficiency. Also, if one of the



Phantom Arrangement Using Condensers.

physicals was longer than the other, the phantom circuit would be unbalanced and noisy. The greatest care would need to be given to getting condensers of exactly equal capacitance. It is an interesting laboratory experiment and could give selective circuits, but is not commercial.

Physical Connection of Telephone Lines and the Law

History of La Crosse Physical Connection Case—Unfairness of Tolls Imposed by Commission Order—Concluding Installment of Paper Read at the Second Annual Convention of the Independent Telephone Association of America

By Frank Winter

The physical connection law was passed in the early part of 1911. Up to the summer of 1911 no attempt had been made in the state to put it in force. Conditions at La Crosse were almost intolerable. Both the Bell and Independents had exchanges and toll lines at La Crosse. The La Crosse Telephone Co., an Independent company, had some 4,000 subscribers, and the Bell company 1,250.

Telephone Conditions at La Crosse.

The Independent company was declaring dividends, the Bell had an annual deficit of $12,000, now over $13,000. Within a radius of 50 miles were some 15 or 20 towns of from 600 to 4,000 or more inhabitants. The exchanges in these towns were generally Independent. Both the Independent and Bell toll lines reached many of these towns. The rest, except in three cases, had only the Bell toll lines. The Bell lines alone reached Madison, Milwaukee and Eau Claire, with which there is considerable business, especially the two first mentioned. These cities have Bell exchanges only. The Bell exchange was not connected with the Independent toll lines; this cut its subscribers off from convenient connection with several towns, and most of the farmer lines, for both outgoing and incoming calls.

The Independent exchange, not having been connected with the Bell toll lines, its subscribers, of course, could not reach towns having only the Bell exchanges, or reached only by the Bell toll lines.

If an Independent subscriber at La Crosse desired, for instance, to talk with Black River Falls, connected with La Crosse by the Bell toll lines, the Bell company would not receive the call over its subscribers' line connected with the Independent switchboard. The Independent subscriber was obliged to go to the office of the Bell company, and then put in his call, or find a Bell subscriber who would allow the use of his telephone, put in his call, and get the subscriber's O. K. for the message, paying there. In case of an incoming call from Black River Falls to the Independent subscriber, the subscriber was notified by the Bell over its wire connecting with the Independent exchange, and directed to come to the office or go to a Bell subscriber's telephone for the message. This, of course, requires two complete connections with the toll lines and exchange at Black River Falls, one for the call and another for the message. In my case about half my calls, out and in, are over the Bell, and taking the Bell and Independent subscribers of the city, probably one-third of the toll business, outgoing and incoming, is done by using the utility of the other company.

To illustrate further the inconveniences the public were put to at La Crosse, owing to lack of physical connection: Prairie du Chien has an Independent exchange, but is connected with La Crosse only by the Bell toll lines. The speaker within about half an hour of the calling of the court at Prairie du Chien learned that a case he was interested in might be called, and owing to his non-appearance, a judgment might be taken. He desired to get another lawyer at once to answer for him, and called up the Bell over his telephone, requesting connection with Prairie du Chien at once. The answer was: "You will have to come to the office; we cannot receive your call over this line." I did so, and put in the call, instructing where they could find the lawyer. After a time they answered: "He has not our telephone, shall we send for him?" I said: "Yes, and be quick." After waiting a while I went to my office, two blocks off, where later I was called over my telephone and directed to come to the office, that they had my man. When I got to the office, of course, the connection was severed, and I had to wait while they connected with Prairie du Chien again. It was over 45 minutes before I could reach the lawyer, and meanwhile judgment was taken against my client, and we had the costs to pay to open it up. Four connections were made with Prairie du Chien; the lawyer and I both lost a lot of time, and my client and I lost some money.

All this was absolutely needless. If there had been a physical connection of the different systems, one call would have sufficed, and my business would have been done in three minutes. This is only an illustration of the inconveniences telephone users were put to at La Crosse. Similar conditions existed, without doubt, throughout the state. Believing that a physical connection between the exchange of the one and the toll lines of the other at La Crosse should be had, and at the request of other citizens, I started proceedings to compel the connection. I first demanded of each company that they allow it. The Bell company refused; the Independent said they could not act alone. I petitioned the commission to order connection. The Bell company appeared by able local counsel, and its general counsel in Boston and Chicago, and answered that the law was unconstitutional, setting up half a dozen sections of the state and Federal constitutions it controvened, and, further answered that such connection would ruin their exchange at La Crosse, and deprive them of their property without compensation, and would be of no value to the public, while of great detriment to their subscribers.

First Hearing in La Crosse Case.

In January, 1912, the first hearing was had before the railroad commission at Madison, I, calling as witnesses in behalf of the state, and at its expense, officers and managers of both companies at La Crosse, and managers and owners of the Independent exchanges and lines in the territory tributary to La Crosse.

Independent and Bell officers and managers from other towns were called, as well as noted experts connected with the Independent telephone business. Of course, the Bell company had its experts and managers present. The hearing was adjourned, and further testimony introduced. After considerable delay and several hearings for the purpose of argument, the commission, on May 14, 1913, rendered its decision requiring a physical connection, prescribing the manner of making it, and apportioning the cost equally between the La Crosse companies. For some time it was understood that the connection would be made. No connection was, in fact, made.

The Bell company, in August, 1913, brought suit in the Dane county circuit court to set aside the order, and to enjoin the commission from proceeding further. When it was understood that connection would be made, on my application a hearing was had to fix rates. The Bell suggested to the La Crosse company, and to me, that they would allow the use of their toll lines on the following terms:

Each subscriber of the Independent company desiring to use the Bell toll lines must become a subscriber of the Bell, paying $6 a year. For calls over the Bell lines he was, in addition, to pay the Bell company 15 cents for a completed call, and the regular toll. They attempted to justify these rates at the hearing, and suggested no other. In behalf of the public, I contended that the regular toll only should be paid, and that the Bell company should allow the La Crosse Telephone Co. the commission for originating business that it allowed the other Independent companies with which it had contracts.

Toll Fixed for Interchange Service.

Early in 1914 the commission made a temporary order allowing the reguar toll to each company, and besides this five cents differential, to bepaid the owner of the line on each completed out call within 50 miles; ten cents, up to 100 mile, and 15 cents for each call over 100 miles. On in calls the differential is paid to the exchange of the subscriber called and not to the owner of the toll line..

This differential is unreasonable. There is no reason why the La Crosse Telephone Co., for instance, should originate the business, furnish its exchange equipment, collect the Bell company's tolls and the differential, and get nothing, while the Bell company pays the Independent Sparta exchange 15 per cent. of the tolls for originating the business. Suit has been brought by the Bell company to set aside this order, and is still pending. No hearings have yet been held.

Anyone interested can petition the commission to modify the order, which is confessedly temporary and experimental; and in the interest of the public the commission will be asked to do away with the differential. It is believed that the commission allowed this differential temporarily, that there might be less chance for reversal or appeal, and as a basis for future fixing of rates. In May, 1914, the case of Bell Company vs. Railroad Commission, Winter and La Crosse Telephone Co. was heard at Madison, but was not decided.

The Bell company, after the order fixing the rates and this hearing, consented to a physical connection, still prosecuting, however, their case to set aside the order directing physical connection, on the ground that the statute and order were unconstitutional. The public has had the benefit of physical connection since September, 1914, on the terms fixed by the rate order.

After the physical connection, and while the court was considering the matter, the Bell company moved to dismiss the case, which would have left the constitutionality of the law and of the order still open. It could not be dismissed without my consent. It was not dismissed, and a decision was rendered by Judge Stevens in December of 1914, sustaining, in a very able opinion, both the law and the order. Because this is one of the first cases sustaining such a law, and because it so clearly states the position the Independent people should assume in future litigation, I take the liberty of quoting from the opinion:

The commission has separately found each of the three essential facts required by Sec. 1797m-4, Stats. 1913. These findings are supported by the evidence. The only question presented is whether, conceding the existence of these facts, any of the constitutional rights of the plaintiff are violated by ordering such physical connection, as was ordered in this case. As the order makes no attempt to compensate for any taking of plaintiff's property, it cannot be sustained, unless it is a reasonable regulation of the business of the plaintiff under the police power.

The property of the plaintiff has been dedicated to the use of the public for the purpose of transmitting oral messages. It is the duty of the plaintiff to afford adequate facilities to the public, and to extend its service to any person who complies with such reasonable regulations as may be established. The petitioner, or any patron of the La Crosse Telephone Co., is entitled to such reasonable service at any station of the plaintiff, subject, of course, to such reasonable regulations as may be established.

The order does not devote the plant of the plaintiff to any new or different service from that to which the plaintiff has already dedicated it in the service of the public. The order simply gives the petitioner, and other patrons of the La Crosse Telephone Co., additional facilities for using the property of the plaintiff in the very service to the public which the plaintiff has dedicated its plant.

The property of the plaintiff is not taken from its control to any greater extent or in any different wav than that in which it is taken when either the petitioner or any of its own subscribers uses its plant for the service which the plaintiff holds itself out to perform for the public. Outside of such control over the equipment of the plaintiff as a patron must of necessity have while using its plant for long distance service, the order does not interfere with plaintiff's complete control and sole ownership of every part of its plant.

The order is simply a reasonable regulation, which increases and extends the public service of the plaintiff's plant within the very field in which it had held itself out as ready to serve the public. It is not a taking of plaintiff's property within any of the constitutional inhibitions.

The analogy between the case at bar and those in which physical connection of lines of railway have been sustained is very close. In fact, in the railway cases the control of the companies over their property was interfered with to a much greater extent than is the case with the physical connection of telephone plants.

In this litigation, the Bell company conceded in its testimony before the commission, that the apparatus of the Independent company was equal to its own; that there was no physical obstacle to the connection; that it could be made at a nominal sum; that it would be of benefit to the public. It was conceded that the public at La Crosse, and thereabouts, was seriously inconvenienced, and that such inconvenience was needless. The position taken by the protesting company, at La Crosse, and in Wisconsin, is similar to the position it has taken in Oklahoma, California, Montana, Oregon, and everywhere when the public has attempted by legislation to compel a physical connection, or to control its monopolizing and unsocial practices. It is a position of "the public be hanged; we owe our first duty to our stockholders, and not to the public." It is a position no public service corporation ought to take, or can long take. It is impolitic and indefensible, even from a purely selfish standpoint, especially for a telephone company. Wisely or unwisely the public will not submit to a monopoly of the telephone business, unless it be a government monopoly. Rightly or wrongly the people in many localities are especially hostile to a foreign owned or controlled monopoly. At La Crosse, the local company is locally owned and controlled. Some years ago the Wisconsin Telephone Co. cut its rates to one-half the local, and way below what the service cost, offering long time contracts at one-half the local rates, recouping itself, of course, by its charges in other communities. Such unfair competition is now impossible by law in Wisconsin and should be everywhere.

The Necessity of Physical Connection.

For years the local subscribers remained loyal and increased, while the other company decreased, so great was the prejudice against the foreign controlled old company. Efficient service, were it possible by private monopoly, is not possible in the present state of public opinion, because private monopoly is impossible.

It is well for all telephone owners and managers to look the situation full in the face. The public demands efficient and convenient service. Because physical connection will give better, more efficient and convenient service the public will demand it. It will not demand it for the benefit of the Independent, or any other companies. It will demand it, and does demand it, for the benefit of the public. How long do you

believe the public would submit to the expense and inconvenience of the unloading and reloading of freight with every change of carriers? Suppose the railroads should refuse to make through tariffs and joint rates for freight and passengers. What would happen? Would the people submit to it?

In hundreds of towns where they could not make satisfactory arrangements with the existing company, the farmers lines have their little exchanges. In many cities, like La Crosse, there are large Independent exchanges. The Bell controls most of the toll lines, the Independents many, if not most, of the exchanges in west Wisconsin, and I suppose that is the fact in many localities elsewhere. The owners of the farmers lines and of the little local exchanges cannot afford to build lines to the larger trade centers of the locality, and it would be false economy to do so if they could, when there are existing lines to handle the business. Neither should the larger exchanges be compelled to build toll lines to every locality and to all the great centers, when there already exist lines that could be conveniently used if the owners would permit. As well ask each locality, or each little local railroad to build connecting lines everywhere parallel to existing lines in order to get convenient and adequate service.

The subscribers of the little farmer exchanges and lines, and of the larger Independent exchanges are asking for physical connection and reasonable through or just rates, not for the benefit of themselves, but for the public. It is no answer to say that it must not be granted because it may benefit the Independent companies. Neither will the courts pay much attention to the claim that legislation clearly beneficial to the public is unconstitutional, merely because it benefits one class of owners more than another.

When I heard able counsel argue, before the commission and court, that it was a sacred right of their client to refuse to grant physical connection because by refusal of connection that client could compel certain members of the public to give up better and more extensive telephone service in order to obtain the toll service of that client, I wondered where the public and I came in. And when I heard them gravely argue that such legislation was unconstitutional because it deprived them of this power of clubbing the public, I wondered where the logic came in. Many years ago a certain railroad which also owned a stage line insisted in a great court that it was their sacred right to refuse to carry any passenger who came to town by a competing stage line, because thereby that rival stage line would be able to compete with them, and that to compel them to accommodate the public who used this rival line was unconstitutional because it deprived them of this club. But the great court made short work of this argument. Neither would that great court have sanctioned the imposition of an additional or arbitrary rate on the user of the rival stage line. Many years ago a great telegraph company refused to receive messages from an independent company because it had disabled itself by contract with a great telephone company from doing so, but a great court held it was bound to receive the messages of each on the same terms, as a common carrier of telegraph messages.

Unfairness of the La Crosse Order.

The A. T. & T. Co. has been expressly held to be a common carrier of telephone messages, but assumes to say it will only receive messages coming from certain other common carriers of messages, and that for the public to compel it as a common carrier to treat all alike is unconstitutional. The Great Northern is a common carrier of passengers. May it refuse to carry a passenger coming to St. Paul on the Milwaukee, instead of the Burlington, its allied line? May it impose an arbitrary rate in addition to the established fare on a person coming to St. Paul on the Milwaukee? Why should I pay 5, 10 and 15 cents more for a message over the A. T. & T. lines, for instance, than my neighbor who has the other telephone pays? The service rendered is the same. In each case a switchboard is connected with the A. T. & T. lines, in one case the Independent board and in the other the Bell. That this 5, 10 and 15 cents additional, imposed by the order of the commission at La Crosse, over the regular toll is merely arbitrary, and is not based on service, is shown by the fact that the amount depends on the distance. If imposed for service rendered in making the connections, manifestly it should be a flat rate without regard to distance.

Decree in Pacific-Northwest Suit.

The imposition of this arbitrary differential, is clearly not in harmony with the decree entered last March in the United States district court of Oregon, in United States vs. A. T. & T. Co. and other Bell properties. You are all familiar with this suit and the decree through its publication in Telephony of April 4, 1914, and comments published since.

I have carefully read the remarkable contract of the A. T. & T. Co., submitted to the Independent telephone companies in March. It is easy to see where the Independents come in. They don't come in for anything at all. But where does the public come in? Any one calling me over the Bell pays the usual toll to the Bell line, and besides this ten cents, all absorbed by the Bell. On an out call I pay the usual toll and also ten cents, all absorbed by the Bell.

Charges of a public service corporation are supposed to be based on actual service, and are supposed to go to the one performing the service. Here is an arbitrary differential imposed on the public without regard to amount of service. All the obligations are imposed on the Independent, while the Bell is relieved of a part of the service and all the obligations of connections, collections and losses by delinquent bills. The Bell gets the arbitrary. This is by no means the sum of the inequities of this remarkable contract so far as the public is concerned. More than half the calls originate within 50 miles, at least that is the fact in West Wisconsin. Most of the calls originating in the little Independent exchanges are short distance calls. Most of the common fellow's calls are short distance. This agreement prevents a physical connection of the local systems in the communities served by both companies, within a radius of 50 miles.

The attorney general of the United States represents the public. Imagine the presentation to him of such a contract in which the interests of the public using the Independent telephones are entirely ignored. The contract is based upon the supposition that in no other way than by such a contract can the public obtain switch connections and joint rates over these common carriers of telephone messages. This supposition is not correct. The state can, in the exercise of its police power, control the practices and fix rates of all public carriers and utilities. It has compelled the physical connection of other public carriers, and has done this without the payment of compensation to either, other than the imposing on the one asking it possibly more of the cost of the mere connection, generally trifling.

For the joint use of the facilities of the utilities it need impose no toll greater than that which will give a fair return for the service rendered. To be constitutional the law need provide no arbitrary charge over that fairly remunerative, because such an order does not amount to a taking. What the Independent should do is not to enter into any one-sided contracts to get physical connection, but go to the legislatures of the states with fair, carefully drawn bills, requiring physical connection and joint service at reasonable rates. Models for such bills can be found in some of the laws requiring physical connection of railways, which have been held constitutional by the Federal Supreme court and the courts of the states. The deciding on the terms of "physical connection," and what is a reasonable rate should be delegated to the public utility commission controlling railways and other utilities.

If the Bell companies fight such legislation, the Independents

should push it to a quick hearing and decision in the courts. Under the decisions quoted the commission can order a physical connection in Wisconsin, for instance, by which points outside the state can be reached.

THE GOVERNMENT OWNERSHIP QUESTION.

I have said the owners and managers of telephone companies should face the facts. One of the facts they must face is that already there is a suggestion that the Federal government add the telephone and telegraph business to its postoffice department. The argument is heard that it has the buildings in many cases, can borrow money at half the rate the utilities can, and has less overhead charges because it can consolidate the business with the mail service, and can carry on the business as efficiently as it does the mail and parcel post service.

The public demand convenient, prompt, efficient service, at rates representing a reasonable return on the capital used and useful in the business. They want no private monopoly. Because they did not believe they were getting convenient and efficient service at reasonable rates from the express companies, in many cases, refused to make joint and through rates; because they did not serve the small towns and rural neighborhoods; because they were guilty of unsocial practices; the government established the parcel post, and will gradually drive out the express companies. Because the public believes it may not get adequate steamship service in a great emergency, wisely or unwisely, it may go into the carrying trade.

If the express companies had made a greater effort to extend their business into the small hamlets, had agreed on joint rates and through routing over each other's lines; if they had charged no unreasonable rates, and engaged in no unsocial practices, there would have been no parcel post today.

The people demand of the telephone companies prompt and efficient service, reasonable extension into new territory, physical connection, reasonable joint and through rates of toll. If the public obtains these things from private owned companies or associations your generation will not probably see the state or Federal government in the telephone business. It rests largely with you, and such as you, to determine what the outcome shall be.

The Telephone as a Truancy Cure.

The telephone is being regularly used by the Los Angeles, Cal., public schools as a truancy cure. Each school has a telephone switchboard and a list of the parents and telephone number of each pupil, so that the reason for absence from school is quickly ascertained. The exchange is operated in short shifts by the pupils as a part of their regular school work.

Number of Directors in A. T. & T. Board Reduced.

A reduction in the number of members of the board of directors of the American Telephone & Telegraph Co. from 25 to 17 was voted at a recent meeting of stockholders of the company. The contemplated reduction is in line with the policy of many of the large corporations of the country to have smaller boards of directors.

Chief Operators of Texas Meet in Convention.

The Southwestern Telegraph & Telephone Co.'s chief operators of the various exchanges throughout the Victoria operators of the various exchanges throughout the Victoria Representatives were present from Corpus Christi, Beeville, Cuero, Goliad, Edna, Hallettsville, Kenedy, Yoakum, Yorktown, El Campo, Ganado, Port Lavaca and other points.

From Factory and Salesroom

Convention: Eastern Pennsylvania, Harrisburg, April 7, 8; Tri-State, Memphis, Tenn., May 21, 22

The New Matthews Telefault.

At recent conventions, a new type of telefault, known as the Type "C" Matthews Telefault, was exhibited. As it seemed to have many features of particular interest TELEPHONY wrote Claude L. Matthews, vice-president of W. N. Matthews & Brother, Inc., the manufacturers, for information relative to it.

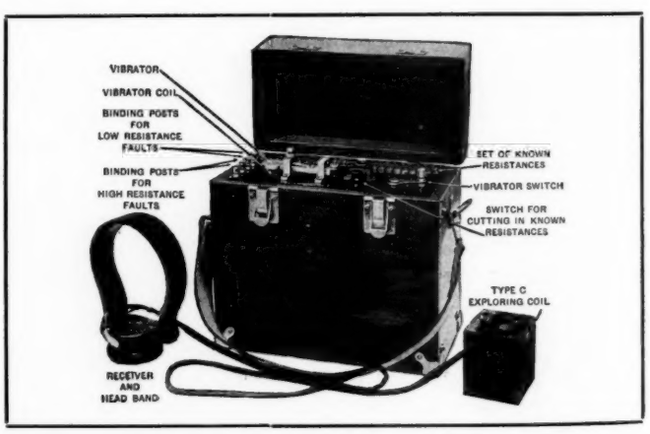
Mr. Matthews promptly responded with the following letter:

"Replying to your recent request, asking for information regarding the Type 'C' Matthews Telefault, which we exhibited at the two national telephone conventions and at the convention of the Western division of the Association of Railway Telegraph Superintendents the middle of March, the reason we have not given out any information for publication, in regard to it, is because we wanted to carefully check the astonishing facts regarding it. We wanted to be absolutely sure that the instrument would do all that we were to claim for it.

The Matthews Type 'C' Telefault is the result of 15 years of experience and study of cable conditions by O. F. Tallman, who is now in our employ.

When Mr. Tallman came to us last fall and told us that he had an instrument that was very much more efficient than our Type 'A' Matthews Telefault; that weighed eleven pounds less; that required the use of only one cell of dry battery; that combined in one instrument a fault finding set which would locate all kinds of troubles in cables, excepting 'opens'; a fault finding set that would locate troubles in open wire toll line work; a tone test set; a loop meter, and a howler—all of which would not 'noise up' other working pairs—you can imagine that we were about to press the button for the 'fool killer.' However, he produced a crude instrument and very soon showed us that he had something that was going to revolutionize the location of cable troubles, as well as open wire troubles.

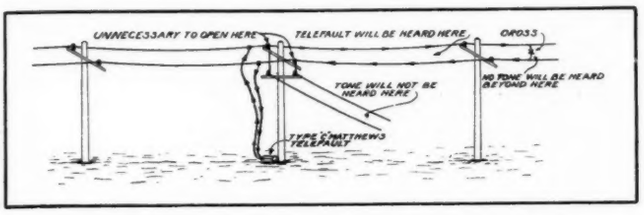
The up-shot of the whole matter was that we engaged Mr. Tallman, and gave him shop room to perfect his instrument. We had twelve of these Type 'C' Matthews Telefaults made up by hand and sent them out to twelve different parts of the country, to be tried out by telephone men who knew nothing about the instrument, except what the directions told them. In every instance, the new Telefault was kept.



The Matthews Type C. Telefault.

The Type 'C' Matthews Telefault will locate 'dead shorts';

wet trouble, both high and low resistance; crosses, grounds, split pairs, etc. It will not locate 'opens.' The tone is not a hum, but sounds almost exactly like a riveting hammer or woodpecker. The voltage sent out on the line is not over four volts. The tone and the low voltage is the reason why


UNNECESSARY TO OPEN HERE
TELEFAULT WILL BE HEARD HERE
CROSS
TONE WILL NOT BE HEARD HERE
NO TONE WILL BE HEARD BEYOND HERE
TYPE C MATTHEWS TELEFAULT

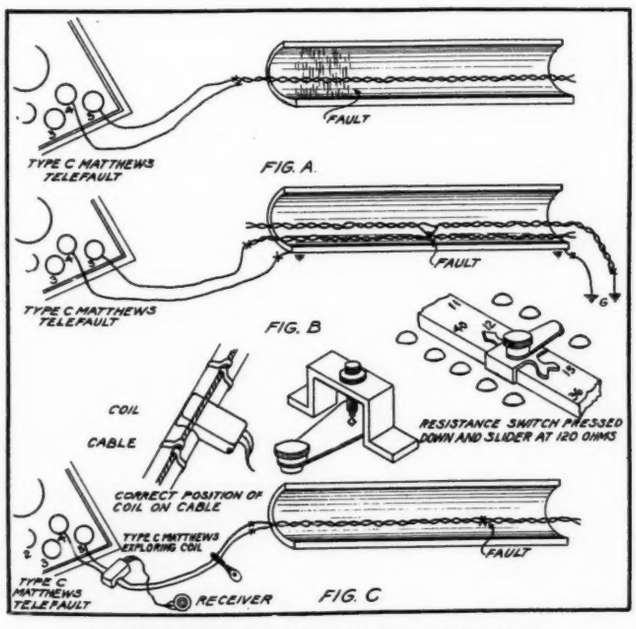
Using the Type C. Telefault on Open Wire Lines.

this instrument does not 'noise up' other working pairs in a cable through which a test is being made. The instrument has been used for half a day at a time on a cable, without any complaint from the wire chief or reports of noisy lines. One cell of dry battery is used.

The instrument contains a set of known resistances, by means of which it is possible to make an approximate location of the fault before going out to look for it. This scheme works very well and is a great improvement. It enables the troubleman to make a preliminary location test before leaving the exchange. It answers the same purpose as the galvanometer and the location can be made within 300 feet of the trouble on ordinary cable. The troubleman is able to locate the trouble within 15 minutes to one-half hour after reaching the approximate location. Ordinary cases, including the preliminary location, do not take over two hours.

The Type 'C' Matthews Telefault may be used on open wire rural lines, without opening the lines. This feature cuts down the time to make a test at a junction pole from 20 minutes to about three minutes. To determine the direction of the trouble, it is only necessary to make two contacts with the line wires.

The instrument, which is of convenient shape for use in difficult places, is about 8 inches high, 5 inches wide, and 10 inches long.

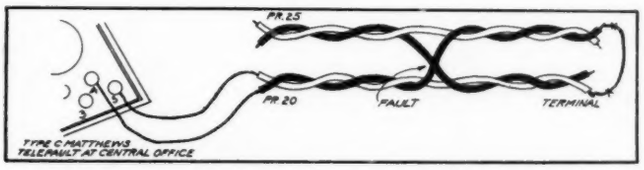


Locating Cable Trouble With Type C. Telefault.

A cable troubleman and his helper usually carry from 70 to 80 pounds on their trips. When supplied with a Type 'C' Matthews Telefault, this weight can be reduced to about 50 pounds. You will see from the above that we were very cautious in predetermining the value of Matthews Type 'C' Telefault.

The final thing we did, was to exhibit one at the convention of the Independent Telephone Association in Minneapolis and immediately after at the National Independent Telephone Association's convention in Chicago and finally at the superintendents of telegraph convention last month.

The result of these exhibits was orders for 49 instruments. This was very much beyond our fondest hopes and we have



Matthews' Type C. Telefault Used to Locate a "Split Pair."

been working very hard, trying to fill the orders. We feel sure, however, that we will have them all cleaned up and be ready to deliver the instruments promptly, after April 20."

Public Utilities Reports Annotated.

The Utilities Publication Committee, of New York, has announced that a plan has been perfected whereby the Lawyers' Co-operative Publishing Co., of Rochester, N. Y., has undertaken the publication of the decisions of the various public service commissions in the United States, exclusive of the Interstate Commerce Commission, beginning January 1, 1915. The series is to be known as "Public Utilities Reports Annotated," and has the endorsement of the National Electric Light Association, the American Street Railway Association, the American Gas Institute and the Investment Bankers Association of America.

The reports will include the decisions handed down after January 1, 1915, of all of the public service commissions, of whatever name, in the United States, excepting decisions of the Interstate Commerce Commission. Routine and informal rulings containing no principle will be omitted, while opinions dealing with questions of valuation, capitalization, the amount of return to which a public utility is entitled, what constitutes confiscation of public utility property, rules, general orders, accounting systems, and the like, which are considered of permanent value, will be published in full. The reports will also include the more important court cases involving public utility questions, particularly those reviewing the decisions of the state commissions.

The Lawyers' Co-operative Publishing Co. has provided a competent editorial staff to review all material and forward advance sheets immediately upon receipt of decisions, the same matter later to be furnished to subscribers in bound volumes. Both advance sheets and bound volumes will contain ample head-notes, indexes, digests, tables of cases, as well as full annotations referring to earlier cases, thus making possible a comparison of cases as to agreement, disagreement, differentiation, etc.

Each volume will contain at least 1,200 pages of thin India paper, bound in buckram, with carefully arranged indexes, facilitating ready access to all points covered by all decisions. A complete digest in a separate volume will be published at the end of each year.

Further information regarding the price of the reports may be obtained upon application to Z. K. Graham, secretary of the Utilities Publication Committee, 30 Church street, New York.

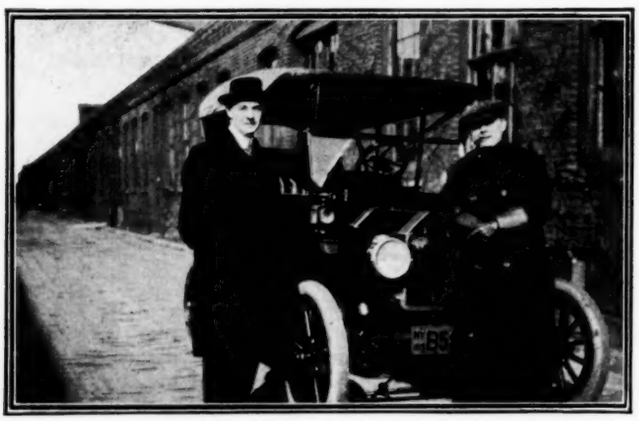
One Good Turn Deserves Another.

Some months ago the Gillespie Home Telephone, of Gillespie, Ill., placed a contract with the Garford Manufacturing Co., of Elyria, Ohio, for a complete common battery

central office eqipment for its Gillespie exchange. About a week ago the same company placed with the Garford Mfg. Co. another order for a two-position non-multiple common battery lamp signal switchboard for its Benld, Ill., exchange.

Caught by the "Kodak Man."

The other day E. A. Reinke, sales manager, and M. S. Van Vleet, advertising manager, of the Stromberg-Carlson Tele-



M. S. Van Vleet and E. A. Reinke.

phone Mfg. Co., of Rochester, N. Y., were lined up in front of their machine by the "Kodak man" in the court of the Stromberg-Carlson plant at Rochester. It will be noted that Mr. Reinke is doing his best to conceal the fact that it's a "flivver."

Benford's Monarch Indestructible Ammeter.

The Benford Mfg. Co., of Mt. Vernon, N. Y., manufacturer of Monarch ignition products, has placed on the market an indestructible ammeter. The inside parts of this ammeter, which is known as Benford's Monarch Indestruct-

Testing With Contact Furnished With the Ammeter.

ible Ammeter, are all compact, made without any hair springs or breakable parts. The tongue, or indicator, is raised by the force of the current and comes back to its original position because of weights which are attached to it. The ammeter is made in a size convenient for carrying in the vest pocket. The company claims that the roughest handling cannot break it, providing, of course, the cap is on. The method of testing batteries by using the contact furnished with the ammeter, is shown in the accompanying illustration.

Larson Brothers Lumber Co. Opens New Sales Office.

The Larson Brothers Lumber Co. has recently established a new sales office at Minneapolis, Minn., under the direct charge of John C. Russell, sales manager. The home office of the company is at Winthrop, Minn., but at present most of its big stock is concentrated at its yards at Kelliher. The company carries a large stock of Northern white cedar poles, thus insuring prompt shipment. It is also prepared to make quotations on Idaho red cedar poles. In addition to handling poles, posts and flat timber are also carried in stock at its Winthrop yards. The accompanying illustration shows part of the large stock at the Kelliher yards.

C. E. Larson, president of the company, and G. E. Lar-

View of a Section of the Company's Yards at Kelliher.

son, secretary and treasurer, are prominent in the pole and lumber industry.

Stromberg-Carlson Farmer Line Bulletin.

The Stromberg-Carlson Telephone Mfg. Co., of Rochester, N. Y., has issued a farmer line bulletin No. 1011, entitled, "A Telephone on the Farm." This bulletin has been prepared, the company states, to bring to the attention of those living on farms and in rural communities how a telephone and telephone system may be obtained, and to describe in a non-technical manner how a telephone system should be constructed and maintained.

The bulletin contains an interesting and convincing article on "The Value of the Telephone in Rural Communities," which sets forth the many advantages of the telephone to the farmer. A model constitution and by-laws are given, and forms for petitions to various authorities for securing rights of way are also presented.

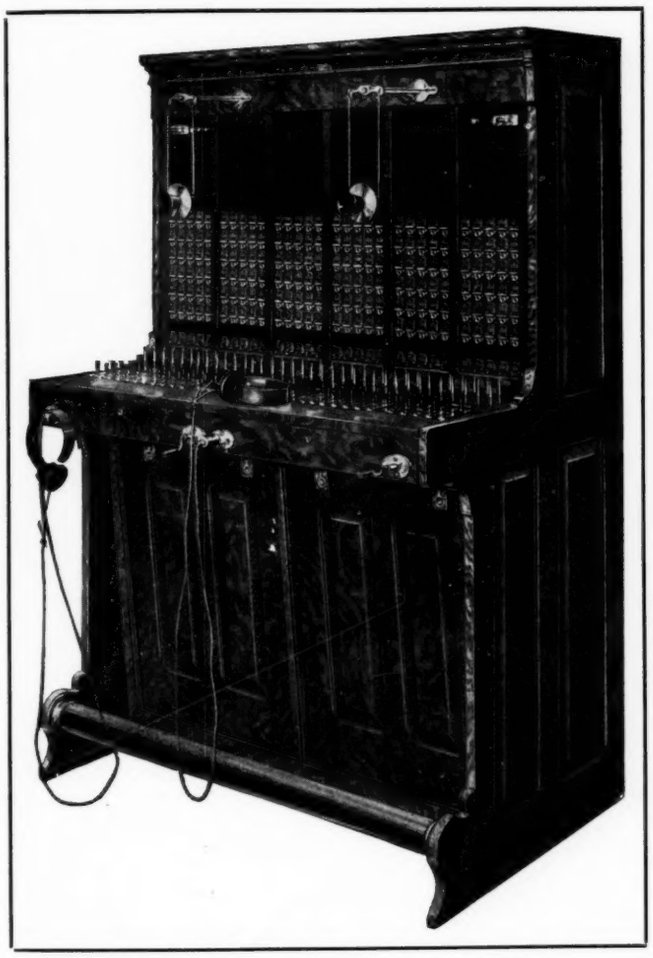
Complete instructions are given for the laying out of a proposed telephone system, including specifications for poles and the proper setting for poles of various lengths, guying and bracing, brackets and cross arms, stringing and tying wire, methods of cutting in transpositions, etc. The installation of magneto equipment is described in detail and a color code set forth for a standard 50-pair cable. Some of the other points considered are the setting up of the gravity battery, the installation of telephones, lightning arresters, interior wiring, the various parts of a telephone, etc.

Persons contemplating the organization and construction of a rural telephone system will find much useful information in this booklet, a copy of which will be sent upon request to the advertising department at Rochester, N. Y.

Garford Central Office Equipment for Brady, Neb.

The Maxwell & Brady Telephone Co., of Brady, Neb., has just placed an order with the Garford Mfg. Co., of Elyria, Ohio, for a complete new central office equipment

of the magneto type. After a careful investigation of the different makes of switchboard equipment on the market, George L. Swancutt, manager of the company, decided that the Garford equipment best met the needs of his company.



Garford Board for Maxwell & Brady (Neb.) Company.

With the installation of this new central office equipment, the subscribers of the Maxwell & Brady Telephone Co. will be assured of efficient service.

Trials of the "Section Hand."

To every casual observer who saunters through a well ordered exchange where the operating girls handle hundreds or thousands of calls an hour with quiet precision, there is no hint of the real "strenuousness" involved in installing that switchboard, or of the lively work of adding a section when increased capacity is made necessary.

The reporter for a local paper happened to be standing in the Rochester shipping room of the Stromberg-Carlson Telephone Mfg. Co. as one of its three-position multiple sections of switchboard was being loaded upon a car. He remarked that the piece seemed heavy.

"It weighs about 1,200 pounds," replied one of the company's experts who was directing the work, "and it is 'some job' from the time that piece starts on its way until the wires are cut in at the exchange.

"As a matter of fact the section is awkward in shape, besides its weight. It is stripped of all unnecessary trimmings before being packed up for shipment. The iron frame itself cannot be taken apart and there is no way to fold it up into a conveniently shaped package. After we load onto the car it travels all right, of course, but when its destination is reached, then the real fun begins."

"For you or the customer?" ventured the reporter.

"For us. The Stromberg-Carlson company handles the whole thing until the last piece of paneling is in place in the exchange and the board ready for operations. Everything is furnished but the girls. In some cities," continued the factory man, "transportation facilities from station to exchange are not very good and we have to make the most of what local conditions afford. I remember once down in Yucatan, where we were installing a big switchboard, the truck that carried it was drawn by six oxen—and the driver didn't even know how to swear in English.

"Loading onto the truck needs care. The average roustabout thinks a switchboard section can stand as much banging around as a 30-centimeter gun, so our men have to be on the watch to see that no damage is done during the moving process. A great many times we find the exchange in a very difficult place to reach. Frequently the regular entrance of the building is out of the question. It is then necessary to hoist the piece up outside and run it through a window, as big safes are handled. Once we handled a 1,000-pound section up through an elevator shaft."

"How do you manage to connect up with the old board without stopping service?" interrogated the layman.

"Oh, that's easy enough. First we set up the section frame—just the ironwork, you know—and level things up. This leveling is very important, by the way. Then the woodwork fellows get busy and dress the skeleton. The next operation is to place the multiple jacks and cables and then we are ready to connect up. It doesn't take long. We have a staff of experts at each of our branches, Chicago, and Toronto, as well as at Rochester, whom we send out on every installation.

The change from the old to the new switchboard is generally done at midnight when calls are few. Everything is made ready on the new board. Then the electrical men cut out from the old board and in on the new by simply making the single cable connection. We rarely interrupt service for a minute. When that's done, we're ready to go back to start another one."

"Do you keep busy these war times?"

"Busy! Well, we don't see that the war has impaired conversation much," and the telephone man bolted back into the office to push through a rush order of equipment for California.

Calendar and Circular Issued by Universal Cable Grip Co.

The Universal Cable Grip Co., of Syracuse, N. Y., has just issued its Universal calendar for the second quarter of the year. The calendar is printed on a good quality of enameled paper and the letters are of a size permitting one's reading it at some distance. On the April calendar are featured the Universal cable grips, several illustrations being shown. The May calendar features the Universal Red-Top anchor, while on the June calendar are shown illustrations of the Universal safety manhole guard.

Accompanying this calendar is an eight-page circular containing more complete descriptions of the Universal service specialties featured on the calendar. Two pages of the folder are devoted to a description, price list and illustrations of the various types of Universal cable grips. "Universal cable grips," the company states, "are proving their worth each day, by handling millions of feet of all types of aerial and underground cable in every branch of construction work. To secure the perfect quality demanded in the standard Universal cable grip, only the finest quality of material is used. This, in the hands of skilled workmen, who weave the cable grip by a patented process, enables us to turn out a hand-made tool that represents the maximum of quality and efficiency."

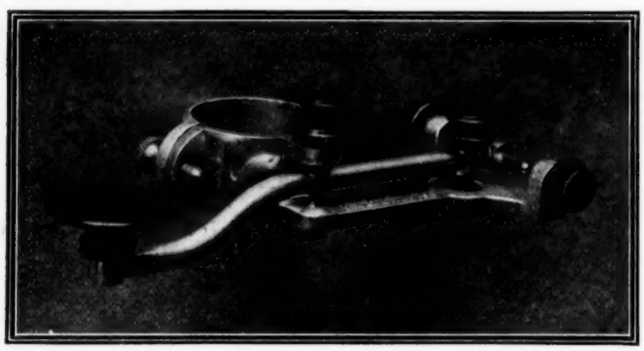
A description, prices and illustrations of the Universal

Red-Top drive anchor are also given. The features of the Universal safety manhole guard are described in detail, as are also a number of other Universal specialties. The company will be pleased to send a copy of this circular and also the calendar to anyone desiring them, upon request.

Telegraph Key and Sounder for Use on Telephone Lines.

Telephone companies quite frequently have occasion to use a telegraph instrument upon the telephone lines. A combined key and sounder has been invented by Paul P. Banholzer which is designed for attaching to the standard of a telephone desk stand and a fairly good idea of its appearance can be obtained from the accompanying illustration. As the new instrument is entirely mechanical in its action, it does not interfere with the telephone circuit. It is very light and compact and does not interfere with the use of the telephone set for the usual telephone uses.

Quite often it is impossible to transmit the voice clearly by telephone and in such cases the clicks or taps from the key and sounder can be transmitted distinctly. It can, therefore, be used as a supplement to the voice, especially



Combined Telegraph Key and Sounder.

in the case of railroad train dispatching where the dispatchers are familiar with telegraph signaling.

Companies interested in the use of a telegraph instrument in connection with the telephone may obtain full information by applying to Paul P. Banholzer, Station K, Philadelphia, Pa. Mr. Banholzer has been working upon this device for over 30 years while he was engaged in the telegraph business.

Book Review.

THE PRESERVATION OF STRUCTURAL TIMBER; by Howard F. Weiss. 312 pages, 6 ins. by 9 ins.; with tables and illustrations. Published by McGraw-Hill Book Co., Inc., New York. Price $3.

From year to year greater interest is exhibited by pole using companies in the matter of applying preservative treatment to the poles in order to extend their life. The author of this book, as director of the Forest Products Laboratory, U. S. Forest Service, has had unusual opportunity to come into contact with many of the problems which confront the layman in the matter of wood preservation. He found that no book covers the subject in its broad aspect and the present volume is an effort in that direction.

The subject matter is taken largely from lecture notes prepared by the author for use at the University of Wisconsin. The first seven chapters take up the general question of wood preservation. The causes of deterioration of wood are discussed as is also the effect upon the wood structure of the injection of preservative. The principles to be followed in preparing timber for preservative treatment are given, after which the processes and preservatives are described.

An interesting chapter to telephone men is that relating to poles and cross arms. Data are given of the cost of treating poles and cross arms by various methods. Estimates are presented showing the annual charges on treated poles and cross arms to be much less than on the untreated timber.

Other chapters discuss the protection of timber from fire and from destructive agents, and the use of substitutes for treated timber. The appendix gives data on the various processes and preservatives with a list of United States patents on wood preservation. Important data is that relating to records of the life of timbers.

Altogether the book will be of value to those who are in any way concerned with the prolongation of the useful period of wood as it contains much information which has not heretofore been available, except through search of many sources.

A Correction of Formula.

On page 46, of TELEPHONY of March 27, is an error in the equation that reads $\frac{45}{16}\times 200=281$. The correct answer to this example is $\frac{45}{16}\times 200=562.5$.

On page 45 of the same issue Chris D. Stewart gives a formula saying: "Call the resistance of the voltmeter R; the maximum deflection D; the deflection through resistance d; and the resistance to be measured x, then $x=\frac{D}{d}\times R$."

The formula $x=\frac{RD}{d}-R=R\left(\frac{D}{d}-1\right)$ will be found to be nearer right. To prove this, I used a 1,600-ohm telephone ringer as the resistance to be measured and found that $D=113$, $R=10{,}000$ and $d=97.5$. According to the formula by Mr. Stewart, $x=\frac{113}{97.5}\times 10{,}000=11{,}589$ ohms which is too much by about the resistance of the voltmeter used.

Using the formula as corrected, $x=10{,}000\times\left(\frac{113}{97.5}-1\right)=$ 1,589 ohms. This is as near right as can be read on a 150-division scale voltmeter and with the internal resistance of the battery unknown.

Millington, Mich. Claude Disbrow.

Paragraphs.

BRUNO GROSCHE & Co., of New York, has moved its offices from 5 Jones Lane to 90 Wall street.

THE GARFORD MFG. CO., of Elyria, Ohio, has placed on the market a clever piece of telephone apparatus in the way of an all steel extension telephone.

THE WYCKOFF PIPE & CREOSOTING CO., of New York, has moved its offices from 50 Church street to the Forty-Second Street Building, 30 East 42nd street.

THE OSHKOSH MFG. CO., of Oshkosh, Wis., has made arrangements with the H. B. Squires Co., of San Francisco and Los Angeles, Cal., and Portland, Ore., to handle its entire line of outside construction tools and specialties on the Pacific Coast. Mr. Squires for many years has been connected with another manufacturer of similar tools and is therefore thoroughly conversant with the line. This fact, together with his long past association with Pacific Coast jobbers, makes him a valuable addition to the list of Oshkosh representatives.

To Exempt Telephone Operators from 10-Hour Law.

A bill exempting telephone operators and establishments maintained by religious, charitable and educational institutions from the woman labor act of 1913, which prohibits female telephone operators from working more than 54 hours a week or more than 10 hours a day, has been introduced in the Pennsylvania legislature.

Condensed News Reports

Officers of Companies Are Urgently Requested to Forward to Us Promptly All Financial and Other Statements as Soon as Issued and Any Items of Interest as to Their Plants and Systems

Personal.

F. G. WEBBER has been appointed manager of the Montreal exchange of the Bell Telephone Co. of Canada.

PRESLEY PERKINS, formerly of Bowling Green, Ky., has been made manager of the Cumberland Telephone & Telegraph Co. at Rockfield, Ky.

R. F. JONES has been appointed division manager of the Bell Telephone Co. of Canada in charge of the Eastern division, with headquarters at Montreal.

GEORGE ROBINSON, of Charlestown, Ind., has succeeded A. D. Cox as manager of the Cumberland Telephone & Telegraph Co. at Corydon, Ind., Mr. Cox having been transferred to Elizabethtown, Ky.

C. V. SIMS, formerly connected with the Trenton Home Telephone Co., of Trenton, Tenn., has leased the exchange of the Sun Telephone & Telegraph Co., at Lexington, Tenn., and will begin an active campaign for new business.

J. C. CAMP, formerly manager of the Cumberland Telephone & Telegraph Co., at Jeffersonville, Ind., has been appointed manager of the company at Rockport, Ind. Mr. Camp succeeds C. E. Travis, who has resigned to engage in the wholesale business at Owensboro, Ky.

M. W. Cox, of Harriman, Tenn., has been appointed manager of the Cumberland Telephone & Telegraph Co. at Bristol, Tenn. He succeeds E. H. Moorer who has been transferred to Harriman as manager of the exchange there.

GEORGE W. CONWAY, south suburban manager of the New England Telephone & Telegraph Co., has been appointed commercial superintendent of the Boston division, succeeding the late James H. Barry. Mr. Conway entered the employ of the New England company about 20 years ago as a contract agent. In 1898 he was assigned to the development of the private branch exchange business and subsequently was made manager of this department. He became south suburban manager at Boston in 1914, and it is said, is one of the most popular officials of the company.

T. W. WILKINSON, plant manager of the Lafayette County Telephone Co., of Lexington, Mo., has resigned to become affiliated with the Lawrence Home Telephone Co., at Lawrence, Kans. Mr. Wilkinson has just recently completed the cutting over of a new common battery exchange at Lexington. He has been ably assisted in his work by his wife. Mrs. Wilkinson, in addition to keeping the records and conducting operators' schools, is quite a "handy man" and can charge the batteries, clear most cases of switchboard trouble and help out on the test board, which goes to show that a woman who puts her shoulder to the wheel can make the men "sit up and take notice." Mr. Wilkinson and his wife started in the telephone business about 12 years ago at Ottawa, Kans. Since that time they have been employed at various places, the last five or six years having been spent in cutting over and re-building a number of plants in Nebraska, Kansas, Missouri and Arkansas.

New Companies and Incorporations.

ASHDOWN, ARK.—A new company is being organized to purchase the Foreman Telephone system. The officers of the new company are: President, A. Goldsmith; vice-president, A. J. Kizer; secretary, John Hawkins; manager, A. B. Killian.

CHAMBERSBURG, ILL.—The Chambersburg Telephone Exchange has been incorporated with a capital stock of $1,000. The incorporators are: H. A. Ham, F. D. Huber and Oscar Dennis.

O'FALLON, ILL.—The Sheldon Farmers' Telephone Co. has been incorporated by E. Mayotte, Albert James and Ross Keen. A capital stock of $637 has been subscribed.

HUMESTON, IOWA.—The Humeston Telephone Co. has been incorporated with a capital stock of $12,000. The incorporators are: D. C. Phillips, C. A. Long and Ray Valentine.

HENDRICKS, KY.—The Hendricks Home Telephone Co. was organized recently by Samuel Arnett, Willson Arnett, C. H. Patrich and Beache Patrich. The capital stock is $300.

GEYSER, MONT.—The Geyser-Davis Creek & Knerville Telephone Co. has been incorporated by the following: President, J. A. McDonough; vice-president, A. J. McDonough; secretary, E. C. McDonough. The capital stock is $20,000.

KNOXBORO, N. Y.—The Knoxboro Telephone Co. has recently been incorporated with a capital stock of $3,000. The incorporators are: A. C. Hayward, T. W. Donovan and H. H. Rathbun.

ENID, OKLA.—The German Rural Telephone Co. was recently organized by H. F. Penner, F. A. Martens, and P. Gossen, with a capital stock of $200.

CELINA, TENN.—The Celina Home Telephone Co. has been incorporated with a capital stock of $1,000. The incorporators are: W. T. Moore H. H. Kife and T. H. Haile.

MCMINNVILLE, TENN.—The Home Telephone Co. has been chartered with a capital stock of $3,000. The officers of the company are: R. Seal, president; A. R. Warren, vice-president; L. G. Patrick, secretary-treasurer.

CROSBY, TEX.—The Crosby Telephone Co. has been chartered by F. J. and W. M. Truwax and J. M. Cobb. The capital stock is $500.

HEREFORD, TEX.—The Block Telephone Co. has been organized for the purpose of constructing a telephone line to connect with the exchange at Canyon. The officers are: E. Edmonds, president; H. F. Miller, vice-president; H. C. Dolcater, secretary-treasurer.

MOUNT AIRY, VA.—The Surry & Carroll County Telephone Co. was granted a charter recently. The capital stock of the company is $20,000.

COALDALE, W. VA.—The Ruth Consolidated Telephone Co. has been incorporated by H. H. McCarren, H. A. Rabel and others. The capital is $10,000.

DOERING, WIS.—The Doering Telephone Co. has been incorporated with a capital stock of $5,000 to construct and operate a telephone line. The incorporators are: P. H. Krueger, Joseph Parent and Robert Miller.

Construction.

SPRINGFIELD, MO.—The Missouri & Kansas Telephone Co. has completed plans for the expenditure of $50,000 for the betterment of the telephone service in this city and surrounding country.

DAYTON, OHIO.—The Home Telephone Co. contemplates improvements and extensions to the extent of $75,000.

OIL CITY, PA.—The Petroleum Telephone Co. contemplates spending $13,000 on improvements in the towns of Titusville and Pleasantsville, and $20,000 for conduits in Oil City.

CLEVELAND, TENN.—The Cumberland Telephone & Telegraph Co. is planning $50,000 in improvements in the coming year.

SODDY, TENN.—The Soddy Telephone Co. is planning to install a new switchboard, telephones and poles.

PLEASANT GROVE, UTAH.—The Mountain States Telephone & Telegraph Co. is planning to spend $10,000 on rebuilding its system in this city.

Underground.

TUCSON, ARIZ.—The Mountain States Telephone & Telegraph Co. is planning to place its wires underground in this city.

SANDUSKY, OHIO.—The Sandusky Telephone Co. is contemplating placing its wires underground in the principal streets of the city.

Financial.

CHICAGO, ILL.—The Chicago Telephone Co. recently declared its regular quarterly dividend of 2 per cent, payable March 31.

CHAPMAN, NEBR.—The Chapman Telephone Co. has declared a dividend of 15 per cent.

GENEVA, OHIO.—At the annual meeting of the Peoples' Telephone Co. held recently, a regular semi-annual dividend of 3½ per cent. was declared.

LUCKEY, OHIO.—The Webster Telephone Co. declared a dividend of 6 per cent. at its annual meeting held recently.

SYLVATUS, VA.—The Reed Island Mutual Telephone Co. has recently increased its capital from $5,000 to $10,000.

STOUGHTON, WIS.—The Edgerton Telephone Co. declared a 6 per cent. dividend at its annual meeting held recently.

VALDERS, WIS.—The Jerpen & Valders Telephone Co. has increased its capital stock from $1,500 to $14,000.

Elections.

BARDOLPH, ILL.—The Bardolph & Bushnell Telephone Co. elected the following officers at its annual meeting recently: President, I. L. Rhodes; vice-president, J. Fuhr; secretary, C. Pontifex; treasurer, G. Stambaugh.

ROCKFORD, ILL.—At the annual meeting of the Rockford Home Telephone Co. the following officers were elected: T. M. Ellis, president; J. H. Camlin, secretary; W. F. Woodruff, treasurer; J. H. Corcoran, manager. Plans were made for extensions and improvements to the extent of $150,000.

BLUFFTON, IND.—The stockholders of the United Telephone Co. elected directors for the coming year as follows: H. Dougherty, L. C. Davenport, J. W. Sales, J. W. Stickney, W. R. Hirst, J. L. Wayne, C. M. Nesbitt, W. B. Cooley and A. G. Lupton.

FAIRMOUNT, IND.—The stockholders of the Citizens' Telephone Co. elected the following directors for the coming year: Oliver Buller, J. H. Simons, R. A. Morris, Ellis Wright and Aaron Newby.

TANGIER, IND.—The annual meeting of the Citizens Telephone Co. was held recently and officers were elected for the ensuing year: President, A. Harvey; secretary, W. Lindley; treasurer, Elwood Jackson.

RED OAK, IOWA.—The Red Oak Telephone Co. held its annual election recently with the following results: F. R. Iddings, president; Geo. Bishop, vice-president; C. E. Peterson, treasurer; T. S. Brown, secretary.

MALCOM, IOWA.—The officers who were elected at the annual meeting of the Malcom Central Telephone Co. for the coming year are: President, Wm. McClure; vice-president, Charles Eisele; secretary, Arden McCoy; treasurer, C. O. Bowers.

COURTLAND, KANS.—The stockholders of the Courtland Telephone Co. held their annual meeting and elected the following officers: President, E. D. Haney; vice-president, A. Anderson; treasurer, R. H. Galloway; manager and secretary, S. F. Tucker.

GENESEO, KANS.—The annual meeting of the stockholders of the Geneseo Telephone Co. was recently held and the following officers elected: A. W. Crosby, president and manager; O. C. French, vice-president; G. E. Bush, secretary; F. H. Norris, treasurer.

GREEN, KANS.—The stockholders of the Green Telephone Co. held their annual meeting recently and elected the following officers: President, Geo. Pfeifiey; secretary-treasurer, A. J. Anderson; directors, A. J. Wilson, W. C. Miles, John Rundle and R. J. Morton.

JAMESTOWN, KANS.—The Jamestown Telephone Co. elected the following officers at its annual meeting held recently: Frank Mooney, president; Julius Jorgensen, vice-president; M. M. Madison, treasurer; H. D. McGaughey, secretary.

MACKSVILLE, KANS.—The officers of the Macksville & Western Telephone Co. were recently elected as follows: A. C. Anderson, president; I. S. Reazin, secretary-treasurer; A. Enlow, M. O. Young and Scott Tucker, directors.

CUBA, KANS.—The directors of the Cuba Telephone Co. held their annual election recently with the following results: John Filinger, president; V. Kesl, vice-president; L. M. Brigham, treasurer; Fred Houdek, secretary.

ROBINSON, KANS.—The following officers were elected for the coming year by the stockholders of the Robinson Mutual Telephone Co. S. M. Ulsh, president; Jere Kimmel, secretary; T. J. Sands, treasurer.

SYLVIA, KANS.—At the annual meeting of the Farmers' Telephone Co. the following officers were elected for the ensuing year: J. O. Batterson, president; A. W. Duer, vice-president; J. B. Jessup, secretary; F. E. Lang, treasurer and manager.

HOWELL, MICH.—The Livingston County Telephone Co. elected its officers for the ensuing year as follows: President, Fred Kuhn; vice-president, John Hilton; secretary, F. H. Lare; treasurer, J. H. Newman.

SAGINAW, MICH.—The Valley Home Telephone Co. held its annual meeting recently and elected the following officers for the ensuing year: C. O. Trask, president; H. R. Martini, vice-president; J. P. Gibbs, secretary-treasurer; W. B. Serviss, general manager.

AITKIN, MINN.—At the annual meeting of the Aitkin-Deerwood Telephone Co. the directors elected the following officers: President C. P. DeLaittre; vice-president, J. B. Galarneault; secretary, F. E. Krech; treasurer and manager, Herman Moork.

ALBANY, MO.—At the annual meeting of the Albany Telephone Co. officers were elected for the coming year as follows: J. W. Agee, president; M. B. Watson, secretary, J. E. Lainhart, treasurer.

CENTRALIA, MO.—The Union Telephone Co. held a meeting recently and elected officers for the ensuing year: President, W. C. Rawlings; vice-president, R. W. Zaring; secretary, Roy Griggs; manager, H. Adams.

SKIDMORE, MO.—The annual meeting of the Consolidated Telephone Co. has recently been held and the following officers were elected for the ensuing year: W. J. Hitchcock, president; Wm. Taylor, vice-president and manager.

NEWARK, OHIO.—The stockholders of the Newark Independent Telephone Co. recently held their annual meeting at which the officers for the coming year were elected as follows: R. W. Smith, president; E. T. Rugg, vice-president; W. S. Weiant, treasurer; C. H. Spencer, secretary; G. B. Sprague, Harry Swisher and R. Hunter, directors.

NEW KNOXVILLE, OHIO.—The New Knoxville Telephone Co. held its annual meeting recently and elected a board of directors who elected the officers for the ensuing year as follows: E. H. Meckstroth, president; G. W. Holl, vice-president; A. H. Stienecker, secretary-treasurer. The company also declared a dividend of 8 per cent.

PERRYSVILLE, OHIO.—The directors of the Farmers Telephone Co. elected the following officers for the coming year: President, Wm. Wigton; vice-president, J. M. Guthrie; treasurer, P. Y. Wigton; secretary, E. C. Kiplinger.

SANDUSKY, OHIO.—The stockholders of the Sandusky Telephone Co. held their annual meeting recently and elected a board of directors who elected the officers for the ensuing year as follows: George Feick, president; T. T. Morgan, vice-president; J. C. Hauser, secretary; J. A. Giedeman, treasurer; J. G. Steinkamp, general manager.

TRUXTON, N. Y.—The annual meeting of the Truxton & Cuyler Telephone Co. has been held with the following results: President, A. R. Bryant; first vice-president, J. H. Waters; second vice-president, F. L. Hilton; secretary-manager, L. D. Crandall; treasurer, P. D. Muller.

MEYERSDALE, PA.—The annual meeting of the stockholders of the Economy Telephone Co. was recently held at which the directors were elected, who in turn elected the following officers: W. H. Ryland, president; W. H. Fritz, vice-president; H. W. Shultz, secretary-treasurer.

OIL CITY, PA.—At the annual meeting of the Petroleum Telephone Co. officers were elected as follows: P. M. Speer, President; W. S. Paca, secretary and manager; R. G. Lamberton, W. E. Hayes, George Kalb, E. C. Hoag, and W. A. McMasters, directors.

GETTSBURG, S. D.—The Potter County Telephone Co. held its annual meeting recently and elected the following as officers: T. E. Schofield, president; Ed. Loitwood, vice-president; August Maas, treasurer; R. L. Flickinger, secretary.

SUNNYSIDE, WASH.—At the annual election of trustees of the Sunnyside Telephone Co. F. J. Taylor was elected president and J. T. Robertson, secretary, E. Thompson, H. N. Paul and D. D. Winkle, trustees.

CASCADE, WIS.—The Cascade Telephone Co. held its annual business meeting recently and elected the following officers: President, W. W. Ford; vice-president, W. J. Joslin; secretary, Wm. Jewett; treasurer, H. W. Grohskopf.

FOND DU LAC, WIS.—The Fond Du Lac Telephone Co. elected the following directors at its annual meeting: W. C. Ray, J. M. Dowd, John Reilly, W. T. Reilly, James Whelen, Wm. Ebert and Oscar Miritz. The officers are: President, W. C. Ray, vice-president, J. M. Dowd; secretary and treasurer, W. T. Reilly.

RIPON, WIS.—At the annual meeting of the Ripon United Telephone Co. the following officers were elected: President, J. B. Barlow; vice-president, Lewis Pynch; treasurer, F. T. Chittenden; secretary and general manager, S. M. Pedrich.

Franchise.

LEWISTON, IDA.—The Lewiston Valley Telephone Co. has been granted a franchise to operate a telephone system between Lewiston and Waha.

WALLA, WALLA, WASH.—A franchise to construct a telephone line has recently been granted to M. H. Paxton and J. G. Stine.

Miscellaneous.

EBENSBURG, PA.—The Huntingdon & Clearfield Telephone Co.'s plant was destroyed by fire recently. The extent of the loss is estimated at $15,000.

CARTHAGE, TENN.—J. B. Chapman has purchased the controlling interest of the Carthage Mutual Home Telephone Co. He contemplates making many improvements and extensions to the system.